Vol. XVI. — No. 12. December 1934.

BULLETIN
OF THE
INTERNATIONAL RAILWAY CONGRESS
ASSOCIATION
(ENGLISH EDITION)

[656]

Competition by roads, waterways and airways.

VII (1).

We publish hereafter, in connection with the question of competition, the information kindly supplied by the General Management (Commercial Departement) of the Italian State Railways, by the Management of the Lourenço Marques Railways and Harbours (Mozambique), the South Indian Railway, and the Government General of Indo-China (Public Works Department) respectively.

ITALY.

Passenger traffic.

At the present time, the public road motor passenger services are regulated by law. Regulation of the motor services was provided for as far back as 1909 by the Royal Decree of the 29th July, No. 710, which stipulates that whoever intends to operate permanently or temporarily a public transport service by means of motor vehicles, must apply to the Minister of Public Works (today the Minister of Communications) who has the power to grant the authorisation and the duty of superintending the working and the regularity of the service, particularly as regards the rolling stock, the timetables, and the rates. These services are subsidised by the State, by the Provinces, and by the Boroughs. The operator of a public motor service has a monopoly in the sense that other motor transport undertakings cannot be allowed the operate over a route which has already been conceded.

The Minister of Communications will not give permission for the service when he sees or foresees that it will compete with the railway. The reason is that competition against railway transport is due not to conceded motor services, but to hired motors.

The measures taken by the Administration of the State Railways are intended in fact to make railway journeys more economical. Such measures are as follow :

— the distance allowed for weekly workmen's and farm labourers' season tickets has been increased from 60 to 100 km. (37.3 to 62 miles);

— the reductions granted to industrial

(1) Cf. *Bulletin of the International Railway Congress Association*, June to November, 1934.

workmen and farm labourers has been extended to clerks;

— the holders of circular tickets are allowed to make as many as 5 journeys in different directions, on condition that such journeys extend to 100 km. (62 miles) there and back, and start from a station on the route mentioned on the circular ticket. The reductions for such journeys vary from 30 to 50 and 70 % according to the case;

— the issue of week-end return tickets has been extended. As a rule such tickets are valid from Saturday to Monday and give a 50 % reduction in the case of single passengers and 70 % in the case of groups of at least 15 people;

— return tickets with a reduction of 50 % have been introduced from all places within a radius of 100 km. (62 miles) round places where fairs and markets are being held, except in the case of permanent fairs and markets or those in the large towns;

— popular trains are still run during the season from June to September. Such trains only run on holidays. There is a 80 % reduction on the ordinary rates and the passenger is guaranteed a seat;

— special reductions have been granted for return tickets in places where competition is particularly severe;

— reductions, the amount of which varies from one case to another, have been granted for mass transport, which otherwise would have made use of motor vehicles run for the occasion (motor char-a-bancs, omnibuses);

Finally, reductions up to 70 % are granted on return tickets to places where artistic, sporting or commercial events are taking place.

In addition to these measures affecting the cost of transport, the Railway Administration has taken steps to improve railway traffic. In particular the number of long-distance fast trains has been increased, with good results, as well as of light trains for local services. Provision has also been made for the use of light units composed of rail motor coaches with petrol engines for local services and on secondary lines, as well as for express services on the main lines.

Goods traffic.

Competition from lorries has gone on increasing in Italy, not only in the case of short-distance transport and for goods paying high railway rates, but also in the case of long-distance traffic and goods of the poorer categories. The State Railways have in consequence had recourse more and more to their chief means of defence, which is the reduction of the cost of rail transport in the districts and for the goods affected by competition, a means of defence which was investigated and applied effectively in former years.

The reduction in railway rates is achieved by a series rate for given services and goods, or else by applying, in individual cases, reduced rates for traffic subject to competition.

With this object in view, competitive rates have been established for the transport of different goods over given routes, such rates varying according to a diminishing scale with the minimum weights of from 4 to 20 tons. Only those manufacturing and business firms can profit by such rates who make an agreement with the railway to send a minimum of 300 tons of goods a year by rail, and undertake not to use competing transport methods within the railway district for which they have been granted the reduced rates. Firms sending by rail, over the same given routes, a tonnage of

more than 2 000 tons a year will receive a further reduction, varying from 3 to 10 % according to the tonnage carried.

Other special rates have been introduced for the transport of wine or must, pressed grapes and empty tuns sent back on given routes, the amount being got out for minimum loads of 5 and 10 tons in the case of wine and must, and 2 tons for empty tuns. Those consignors can profit by these rates who undertake to send by rail in six months, at least 100 tons of wine or must, or pressed grapes, and undertake not to make use of competing methods of transport within the period and district for which the reduced rates have been granted. Consignments exceeding 200 tons receive additional reductions of 5 to 10 % according to the tonnage.

Finally, other competitive rates have been granted for given goods transport affecting maritime centres. For these transports, again, the rates have been fixed on a decreasing scale for weights of 5, 10, 12 and 14 tons, on condition that a minimum of 100 tons a year is carried over a given route. Bonuses varying from 5 to 10 % are provided for when the weight of the goods carried exceeds 200 tons a year.

These special rates are granted to consignors who undertake not to make use of methods of transport in competition with the railway.

In addition to these reductions of a general nature, though limited to given routes and goods, the State Railways also grant, by means of contracts, particular reductions of varying amounts for guaranteed tonnages of transport by different firms within a given time.

The rates procedure has been speeded up, and reductions of varying amount are also granted in respect of given transports which are to be carried out in a short time. These variable reductions are granted when it is certain that otherwise the consignors would send their goods by other methods of transport.

The direct action of the State Railways is seconded by that of the *Istituto Nazionale Trasporti* which, by means of its agencies and through the firms holding concessions under it, draws traffic by granting competitive reduced rates. The Istituto Nazionale Trasporti, always through its agencies, also undertakes to carry out door to door transport, so that its clients no longer have to worry about the intermediate operations at the departure and arrival stations. During the year 1932-33, the goods at ordinary rates collected and delivered by the agencies reached a total weight of about 267 000 tons. A similar service is assured by the Istituto Nazionale Trasporti in the case of luggage. In this case, the Railway Administration, on its side, has set up collection and delivery services on receiving a telephone call, so that all weighing operations, issue of registration form, payment of the rate, and collection take place at the passenger's house. This service has been appreciated by the public.

The Italian State Railways have extended the combined passenger rail and motor services. In the case of people living far from the station, this service will carry out the formalities for consigning and delivering goods, either carriage paid or carriage forward, under the regulations in force on the State Railways, without the customer having to go to the station, the usual railway waybill being used. This service has proved so popular that within the year, 153 561 parcels weighing 390 tons on the aggregate were carried, i. e. from the 1st March 1933 to the 28th February 1934. The road ser-

vices connected up with the railway extend to 10 200 km. (6 340 miles) and link up with the railway more than 2 000 localities which have no direct connection therewith. For the railway journey the railway rates are applied, and for the road journey special rates got out on a fair basis for this purpose. The combined service is limited to 50 kgr. (110 lb.) in certain places; in other places there is no weight limit.

Among the measures intended to fight competition, mention must be made of the express parcels service introduced in 1931. This service assures, with the minimum amount of formalities and at moderate cost, including delivery and in certain cases collection, from the premises of the consignee, the fastest possible transport by direct express trains and delivery within six hours of arrival of small parcels weighing not more than 30 kgr. (66 lb.). The public have appreciated this service, so much so that whereas during April 1932 there were 8 458 consignments, there were 41 625 in April 1934.

The Railway Administration has also purchased a certain number of containers through a financially and legally independent company. Rates and regulations intended to extend the use of this method of transport which solves the problem of door to door transport have been got out. But as this innovation is still in the experimental stage, nothing can be said as to its practical results, except that they appear to be favourable.

* * *

PORTUGUESE COLONIES.

Mozambique.

The Management of the Port and Railway Services of the Colony (Lourenço-Marquès) informs us that it has taken various measures to meet road motor competition.

First of all it has started road services connecting with the railway, for transporting goods and passengers, either by making agreements with the owners of motor vehicles, or by purchase.

The mileage of the motor transport services on the 31st December 1930 was 1 131 km. (703 miles). Various decrees have provided for motor transport zones in which the railway has priority, and no authorisation to start other services is granted.

The highway code has been revised, and the right to authorise new public services has been reserved to the Higher Road Council to which the Management of the Port and Railways belongs. A further revision is being prepared to give the railways still more protection.

* * *

INDIA.

The South Indian Railway has found that the competition of omnibus services is appreciably felt in the case of passenger and parcels traffic. Reduced rates and cheap return tickets have brought back traffic to the railway, and sometimes forced road undertakings to give up business.

In the case of goods traffic, certain sections suffer from the competition of ox-drawn carts up to distances of 100 km. (62 miles). Reduced rates have been successfully applied.

As regards the powers of the Companies, the law has recently been modifield so that railway companies can organise road and air services for the transport of passengers, cattle, and goods,

the terminus of these services being at the railway station or nearby.

* * *

FRENCH INDO-CHINA.

The information given below we owe to the Public Works Department of the Government of Indo-China.

In order of importance, the competitors of the railway are : the road, river navigation, and coastwise navigation.

There is no competition from airways.

Road competition is particularly serious because the main roads lie parallel to the railway and are in excellent condition and motor vehicles are not burdened with many taxes. The road motor vehicle, for various reasons, has a great attraction for the natives, and the transport services organised by the natives are run on very uneconomic lines.

Road competition affects in particular passenger transport and express goods.

Competition from inland navigation is most serious in goods traffic. It is facilitated by the remarkable development of natural or artificial waterways throughout the deltas, which are the most populated and productive parts of the country. These waterways frequently run parallel to the railway, in Tonking, in Cochin-China, and in Cambodia.

Coastal navigation competition is serious all along the coast, to which the Trans-Indo-China Railway runs practically parallel. It affects goods traffic chiefly, but also the passenger traffic (liners serving Saigon, Quinhon, Touron, and Hai-Fong; coastal boats used for both sea and river navigation).

There are three methods of fighting competition against the railway by other transport services :

1) Measures to improve railway operating methods;

2) Measures intended to equalise the burdens of the different transport services, i.e. to make the competition fair, and

3) Indirect measures, which consist of a stricter and more efficacious application of the traffic laws in the interest of public safety.

The last two methods are only applied to road traffic in Indo-China. They have a common characteristic in that they submit road transport to special regulations. The first, on the other hand, makes it possible for the railway to fight all transport services. The methods used with this object do not differ in nature from the means employed by all other industries to fight any competition threatening them : i.e. give better service more cheaply.

1. *Regulation of road traffic.*

This is regulated by a decree which has taken most of the clauses of the French Highway Code and adapted them to local conditions. This decree makes it necessary for common transport vehicles to obtain a preliminary authorisation, and subjects them to periodical inspection.

It would appear desirable, both to put a stop to competition and in the interest of public safety, that the application of these regulations should be under more rigorous control.

2. *Special regulations on road transport.*

The object of these regulations has been to restrict the freedom of the road transport industry in cases in which it is against the public interest, or else to make this industry bear part of the charges met by the Colony itself in order to allow it to function. The appli-

cation of one or other of these two solutions however lies outside the authority of the Governor of the Colony and called for legislation.

The Decree of the 6th May 1933, passed with this object, has in no way restricted the liberty of the industry but has laid down the principle of the need for co-ordination among the different methods of transport, for the public good. With this object in view, taxes have been levied on all transport services, but are unequally divided amongst them so as to weigh more heavily on those less co-ordinated.

For this purpose, the decree makes it necessary for all road motor transport undertakings to obtain a preliminary authorisation. This authorisation can only be refused, however, for motives of public safety or for preserving public property. It can, however, depend on the condition that the transporter gives some guarantee (caution or insurance). It lays various obligations on the carriers in the organisation of their industry (routes, timetables, rates, etc...) which aim at the co-ordination sought for.

The essential clause of this decree is that of making arrangements for the payment of royalties in the form of indirect taxes, the amount of which varies as described above. Finally, penalties are laid down for undertakings which have not been authorised or which have not paid their taxes.

The amount of the tax and the method of collecting it were the object of an ordinance of the Governor General dated the 28th November 1933, and approved by decree on the 15th March 1934.

The routes which are taxed are divided into three classes :

1st class. — Sections less than 5 km. (3.1 miles) from the railway, which pass through at least two different places within the area depending on a railway station or halt.

2nd class. — Sections less than 10 km. (6.2 miles) from the railway, which pass through at least two different places within the area depending on a railway station or halt.

3rd class. — Sections linking up two different places within the area depending on a railway station or halt, and which are more than 10 km. (6.2 miles) away from the railway.

Every place which is less than 10 km. (6.2 miles), as the crow flies, from a railway station or halt is considered as being within the area depending on the nearest railway station or halt.

Various services (town services, touring vehicles, etc...) do not have to pay these taxes.

The division of the routes of a service into sections in the three classes is submitted to the approval of committees known as « land transport co-ordination committees », each of which is composed of members of the elected assemblies, representatives of the railway and of the road transport industries. Indo-China is divided up between three such committees. These committees act in addition as councils to the Governor General in co-ordinating transport.

The amount of the taxes has, experimentally, been fixed at very small sums. For so-called regular services it is :

0.0002 piastre for sections in the first class,

0.00015 piastre for sections in the second class,

0.0001 piastre for sections in the third class,

per vehicle, per kilometre run, and per place offered or 50 kgr. (110 lb.) of goods which can be carried at the same

time. In the case of so-called « occasional » services, it is 0.06 piastre per day per vehicle and per seat offered or per 50 kgr. of goods (The piastre equals 10 French francs).

A vehicle which can carry 20 passengers and 500 kgr. (1 100 lb.) of goods, which covers 200 km. (124 miles) a day over sections falling in the first class will thus pay 30 piastres a month. If it were operated as an occasional service, the amount would be 45 piastres.

3. *Improvement in railway operation.*

The railway has endeavoured to increase the facilities offered to its customers, and to lower its rates.

As far as the first point is concerned, mention must be made of :

— speeding up of the trains;

— improved timetables;

— reduction of the transport period;

— connecting services and delivery at the consignee's premises,

— combined tickets issued in conjuction with road transport undertakings, inland navigation companies, hotels in holiday or watering places;

— a great many different improvements to passenger stock;

— introduction of comfortable rail motor coaches;

— advertising, and promoting travel for pleasure.

As regards the rates, a study of the effects of competition has led to measures for lowering the rates on the one hand, and on the other to granting very diverse and flexible rates. This has been facilitated by the simple and speedy process which has been adopted for approving rates.

This policy, if it has not, up to the present at least, caused a rise in the receipts, has however prevented them from falling off still more, and revived passenger traffic very considerably. As long as receipts and expenditure balance, it is better for the railway to give many services at low rates than a few services at high rates.

[385. 1 & 656]

INTERNATIONAL RAILWAY CONGRESS ASSOCIATION.

INQUIRY INTO QUESTIONS OF IMMEDIATE INTEREST.

(Decision taken by the Permanent Commission at its Meeting held on July 29th, 1933.)

QUESTION II.

« The World Crisis and Railways

and the effects of the crisis on railway working; measures taken to lessen the effect of the crisis; competition or collaboration between railway and road transport; a forecast of the future; new ideas as to passenger transport, such as light quick trains between large towns and between large and small towns, running at regular intervals. »

REPORT

(Main-line railways affiliated to the International Railway Union)

by Dr. COTTIER,
General Secretary, Swiss Federal Railways, (1)
and Reichsbahndirektor von BECK,
Member of the General Management of the Deutsche Reichsbahn Gesellschaft (German State Railway Company). (1)

Foreword.

During the last four or five years, the railways of Europe have been passing through the most serious crisis ever known. For the first ten years after the Great War, the traffic and receipts of railways in most countries continued to increase, whereas in 1932 only 7 railways out of the 62 belonging to the International Railway Union were able to show a balance-sheet without a deficit. Those that could show a net profit could only do so because the State had released them to a large extent of their capital expenditure or at least of the interest thereon. It may be mentioned in passing that, in the United States of America, the passenger traffic for the same year had shown a decrease of 60 %, and the goods traffic of 40 %, on the 1913 figures.

In view of this movement, the root causes of the railway crisis must be investigated and the possibility of ending, or at least lessening it, carefully considered.

(1) Dr. Cottier chiefly dealt with chapter I (Effects of the crisis on the railways), and Herr von Beck with chapter II (Rail and road transport).

In Chapter I, we propose to study the influence of the world economic crisis and the effect of economic changes upon railway traffic. This study must necessarily be limited in its essential points to a table of the changes which took place in the years 1929 to 1932 inclusive, as complete statistical data are not yet available for the subsequent years. The changes since 1933 will simply be indicated in a few words in the final paragraph of the first chapter.

On the other hand, the second chapter will go into the question to what extent the present railway crisis should be considered as a consequence of the radical changes in the traffic itself, and the means already used for remedying or lessening the traffic crisis properly speaking. Here again the most recent changes will be dealt with.

CHAPTER I.

Effects of the world economic crisis on the railways.

A. — Magnitude of the economic crisis.

When considering the influence of the present economic crisis upon the railways, it must be remembered that this crisis is a double one. It is not only an accidental crisis due to a combination of various circumstances, but also a structural crisis, and for this latter reason the opportunities of putting an end to it, to be found in the different European economic policies, is very restricted.

The decline in world trade which has gone on with exceptional intensity since 1929 is most visible in *international trade.*

World commerce.

(Imports and exports, in millions of Swiss francs.)

—	Europe.		Other countries.		World commerce.	
1929	180 176	100	132 264	100	312 440	100
1930	153 972	85	96 705	73	250 677	80
1931	115 168	64	63 796	48	178 964	57
1932	75 126	42	44 132	33	119 258	38

Because of the progressive decline in the absorption capacity of the markets due to the increasing gravity of the crisis and to increasingly serious commercial and monetary difficulties, the exchange of goods between countries has suffered a disastrous decline.

During the years 1929 to 1932, the export trade of Europe has decreased 58 % in value, and that of countries outside Europe 67 %, while during this same period the exchange of goods as a whole has fallen by 62 %. The decline in the value of trade is due above all to the continual decline in world prices due to this sudden change in the general state of affairs. Between 1929 and 1932, world trade as a whole only fell off by 26 % in quantity, but the decline in value was 62 %.

The great fall in prices of raw materials is clearly shown in the table given below of changes in wholesale prices in the world markets. It will be

remarked that in all the countries shown, the downward movement practically follows the same slope.

Index figures of wholesale prices.

(Gold index.)

	1929	*1930*	*1931*	*1932*	*% of decline from 1929 to 1932.*
Germany	137	125	111	97	29.2
France	124	113	102	87	29.8
Italy	131	112	92	83	36.6
Austria	130	117	107	97	25.4
Belgium	124	109	91	77	37.9
Holland	142	117	97	79	44.4
Great Britain	137	120	97	73	46.7
Switzerland	141	126	110	96	31.9
Denmark	150	130	107	82	45.3
Sweden	140	122	105	75	46.4

The two tables given below showing the changes in export trade for the different European countries bring out the fact that all countries have suffered from the decline in international trade in more or less equal proportions.

Trade with other countries.

(Imports and exports, in millions of English tons.)

—	1929	1930	1931	1932
Germany	119 628 100	112 256 94	91 312 76	74 865 62
France	97 799 100	96 060 98	87 030 89	69 923 71
Italy	31 753 100	29 287 92	25 024 79	21 007 66
Austria	14 154 100	11 601 82	10 361 73	7 830 55
Belgium	69 784 100	64 953 93	62 296 89	49 244 72
Holland	46 544 100	47 243 102	45 981 99	37 972 82
Switzerland	9 602 100	9 322 97	9 649 100	9 047 94
Denmark	13 020 100	13 195 101	13 335 102	11 754 90
Sweden	32 282 100	28 793 89	21 855 68	18 080 56

Changes in foreign trade.

(Imports and exports, in millions of Swiss francs.)

—	1929	1930	1931	1932
Germany	33 240	27 603	19 924	12 723
	100	83	60	38
France	22 008	19 305	14 635	10 020
	100	88	66	46
Italy	9 830	8 040	5 881	3 970
	100	82	60	40
Austria	3 925	3 309	2 463	1 350
	100	84	63	34
Belgium	9 753	8 211	6 707	4 456
	100	84	69	46
Holland	9 875	8 585	6 626	4 459
	100	87	67	45
Great Britain	46 383	38 322	27 645	18 355
	100	83	60	40
Switzerland	4 829	4 326	3 600	2 564
	100	90	75	53
Denmark	4 577	4 387	3 437	2 105
	100	96	75	46
Sweden	4 970	4 450	3 307	1 988
	100	90	67	40

The considerable effects of the universal decline in business on economic activity is brought out by the index numbers given below relating to various products :

Amount of world production.

(1929 = 100.)

—	Industrial world production.	Coal.	Lignite.	Pig-iron.	Unmanufactured steel.
1929	100	100	100	100	100
1930	88	92	85	81	79
1931	78	81	78	57	57
1932	69	71	72	40	42

Up to 1929, industrial world production followed an upward curve, but during the last crisis years it has gone downwards constantly. In 1932, it fell to a level much below that of the previous year.

B. — The railways during the economic crisis, 1929 to 1932.

Experience shows that economic crises affect the transport industry particularly severely, and this has been

proved once again by the sudden drop in traffic and receipts suffered by the railways during the crisis years of 1929 to 1932. More complete statistics on the quantitive movements of goods than those available at present, except in a few rare cases, would probably bring out even more strikingly the effects of the economic crisis on the European railways.

The table given below is limited to 10 railways and countries of Europe which are so situated that they show the general change with particular force.

Passenger traffic.

The movement of passenger traffic.

(In millions of passenger-miles.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	29 260	26 905	22 943	19 145
	100.0	92.0	78.4	65.4
French main-line railways	17 452	18 097	17 939	15 874
	100.0	103.7	102.8	91.0
Italian State Railways	4 115	4 629	3 961	3 760
	100.0	111.8	95.7	90.8
Austrian Federal Railways	2 313	2 179	1 979	1 589
	100.0	93.0	84.4	67.8
Belgian National Railways Co.	3 955	4 005	3 610	3 204
	100.0	101.3	91.3	81.0
Netherlands Railways	2 280	2 321	2 185	1 917
	100.0	101.8	95.8	84.1
British main-line railway companies	19 518	19 122	18 046	17 613
	100.0	98.0	92.5	90.2
Swiss Federal Railways	1 825	1 882	1 826	1 725
	100.0	103.1	100.0	94.5
Danish State Railways	659	688	720	719
	100.0	104.4	109.2	109.1
Swedish State Railways	873	953	912	905
	100.0	109.2	104.4	103.7

It will be noticed that the decline in business did not immediately affect passenger traffic everywhere. Only on some railways did such traffic fall off appreciably from the very beginning of the economic crisis. On the other hand, on most of the railways dealt with here, the traffic continued to increase up to 1930, and sometimes even after this date. The violent downward movement only began in 1931. The fall off in traffic was particularly marked on the Deutsche Reichsbahn and the Austrian Federal Railways, i.e. in those countries who had suffered most economically speaking as a result of the world war through the new frontiers and other clauses of the Peace Treaty, as well as through

depreciated currency. If, on the other hand, the passenger traffic of the Danish and Swedish State Railways was greater during the 1932 crisis year than in 1929, this is doubtless due to some extent to the fact than on these railways there had already been a decline in traffic in the years before the general economic crisis.

Percentages for the different classes of passengers.

—	1929.			1932.		
	1st class.	2nd class.	3rd class.	1st class.	2nd class.	3rd class.
Deutsche Reichsbahn . . .	0.03	7.08	92.89	0.02	4.79	95.19
French main-line railways . .	2.78	13.33	83.89	2.41	14.35	83.24
Italian State Railways . . .	2.16	10.69	87.15	1.45	8.83	89.72
Austrian Federal Railways .	0.13	1.88	97.99	0.05	1.02	98.93
Belgian National Railways Co.	0.53	8.25	91.22	0.33	8.03	91.64
Netherlands Railways . . .	2.50	15.63	81.87	1.92	12.77	85.31
British main-line railways . .	5.19	2.20	92.61	4.32	2.02	93.66
Swiss Federal Railways . . .	0.28	4.79	94.93	0.10	4.24	95.66
Danish State Railways . . .	0.03	5.27	94.70	0.03	3.28	96.69
Swedish State Railways . . .	0.07	2.55	97.38	0.04	1.96	98.00

The above table shows that, with a few exceptions, there has been, on the railways given above, a relatively large decline since 1929 of 1st and 2nd-class passengers, while there have been proportionately more 3rd-class passengers.

On the other hand, the table below shows that the alteration in the traffic has resulted in an appreciable diminution of passenger receipts during the years 1929 to 1932. It is particularly noteworthy that the receipts have fallen off more than the number of passengers. This is due in part to the rates reductions. Another reason is the relatively larger decrease in the number of passengers travelling 1st or 2nd-class, either because of the de-classing of the public who, for reasons of economy, now have to travel 3rd, or because of increasing motor competition which attracts to an ever greater extent precisely the better-off passengers.

The economic crisis affected the goods traffic sooner and to a much greater extent than the passenger traffic. Everyone knows, of course, that goods traffic is particularly sensitive to fluctuations in the economic situation. In this case, the decline became evident immediately the general crisis started, and it has continued, more accentuated all the time, until 1932. It has been particularly marked on the Deutsche Reichsbahn, on the Austrian Federal Railways, on the Belgian National Railways Co., and on the Swedish State Railways. The goods traffic of these railways, in tonne-kilometres, fell off by nearly one half from 1929 to 1932.

The close relations between the economic situation and the goods traffic of

Passenger receipts.

(In millions, in the currency of the country in question.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	1 375.24 100.0	1 301.45 94.6	1 115.16 81.1	873.34 63.5
French main-line railways	3 170.86 100.0	3 261.03 102.8	3 169.91 100.0	2 671.25 84.2
Italian State Railways	1 536.87 100.0	1 463.33 95.2	1 275.00 83.0	1 135.82 73.9
Austrian Federal Railways	216.56 100.0	215.05 99.3	188.30 87.0	165.95 76.6
Belgian National Railways Co.	841.74 100.0	950.15 112.9	843.97 100.3	729.51 86.7
Netherlands Railways	85.94 100.0	87.14 101.5	80.91 94.0	69.87 80.5
British main-line railways	60.02 100.0	57.00 95.0	52.39 87.3	49.18 81.9
Swiss Federal Railways	156.24 100.0	159.12 101.8	150.72 96.5	136.76 87.5
Danish State Railways	49.90 100.0	49.37 98.9	49.86 99.9	47.84 95.9
Swedish State Railways	63.84 100.0	68.47 107.3	64.13 *100.5*	59.51 93.2

Goods traffic. — Changes.

(In millions of English ton-miles.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	42 159 100.0	33 434 79.3	27 825 66.0	23 793 56.4
French main-line railways	27 159 100.0	26 380 97.1	24 005 88.6	20 713 76.3
Italian State Railways	7 335 100.0	7 176 97.8	6 243 85.1	5 497 74.9
Austrian Federal Railways	2 780 100.0	2 366 85.1	1 959 70.4	1 602 57.6
Belgian National Railways Co.	5 847 100.0	4 969 85.0	4 217 72.1	3 199 54.7
Netherlands Railways	...	...	...	...
British main-line railways	17 308 100.0	16 280 94.1	14 895 86.1	13 615 78.7
Swiss Federal Railways	1 339 100.0	1 249 93.3	1 149 85.8	944 70.5
Danish State Railways	363 100.0	394 108.6	379 104.6	353 97.5
Swedish State Railways	1 810 100.0	1 730 95.6	1 456 80.5	968 53.5

the railway, and the dependence of this latter upon the outside state of trade are clearly shown by the table and diagrams below. In the case of every railway the comparison brings out the agreement between the two branches of railway activity.

International trade and goods traffic.

(1929 = 100).

—	1929	1930	1931	1932
Deutsche Reichsbahn.				
Foreign trade	100	94	76	62
Goods traffic	100	82	67	58
French main-line railways.				
Foreign trade	100	98	89	71
Goods traffic	100	98	88	74
Italian State Railways.				
Foreign trade	100	92	79	66
Goods traffic	100	91	76	63
Austrian Federal Railways.				
Foreign trade	100	82	73	55
Goods traffic	100	84	72	59
Belgian National Railways Co.				
Foreign trade	100	93	89	72
Goods traffic	100	90	79	64
Swiss Federal Railways.				
Foreign trade	100	96	92	82
Goods traffic	100	96	92	79
Danish State Railways.				
Foreign trade	100	101	102	90
Goods traffic	100	108	100	92
Swedish State Railways.				
Foreign trade	100	89	68	56
Goods traffic	100	93	73	52

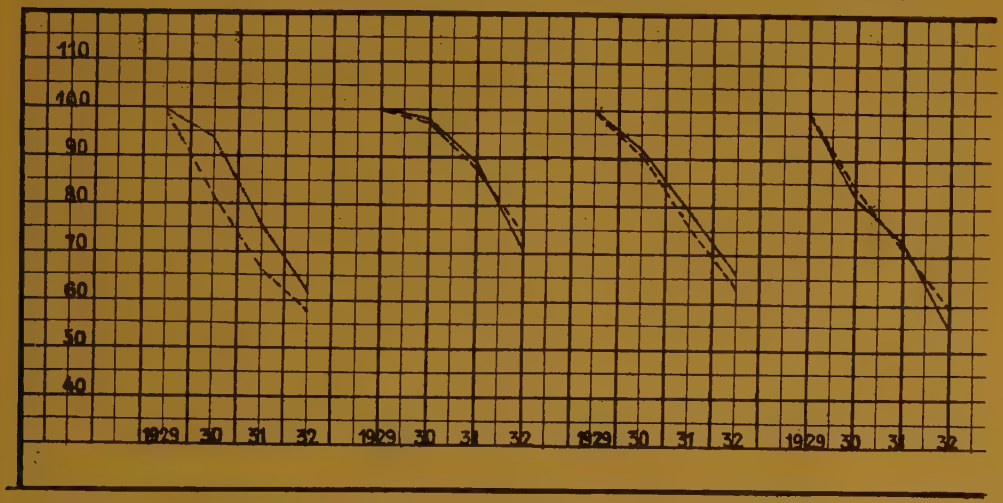
The great decline in goods traffic has naturally led to a considerable decrease in goods receipts. This is particularly noticeable on the Deutsche Reichsbahn, the Italian State Railways, the Austrian Federal Railways, the Belgian National Railways Company, and the Swedish State Railways. In addition since 1929, on several railways, the decline in receipts has been aggravated by rates reductions, and even more in such cases by road motor competition, which, as will be described in Chapter II, has affected in the main goods of value.

The greatest falling off in the total operating receipts is shown by the Reichsbahn whose receipts have decreased by nearly one half from 1929 to 1932; next come the Italian State Railways, the Austrian Federal Railways and the Belgian National Railways Company whose receipts have fallen by about 1/3rd during the same period.

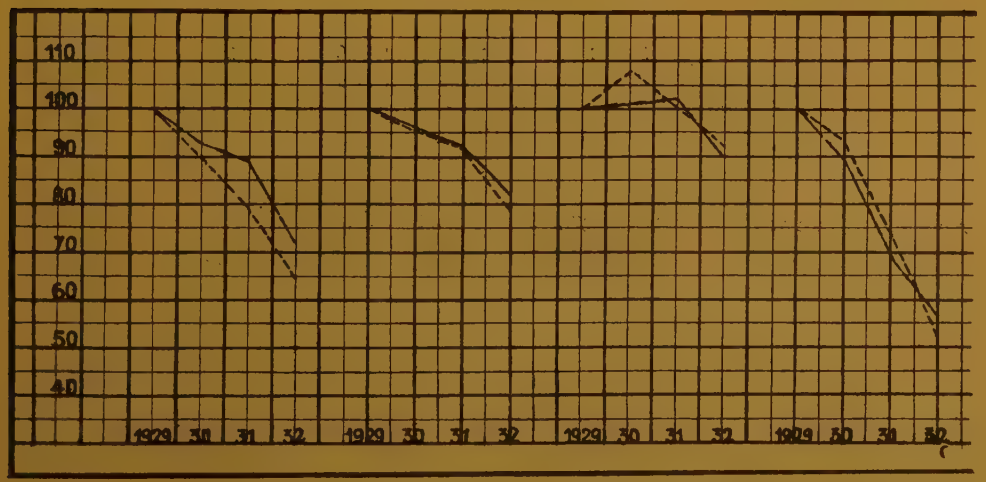
Quantitative changes in international trade and goods traffic during the years 1929 to 1932.

(1929 = 100.)

Germany. Reichsbahn. | **France.** Main-line railways. | **Italy.** State Railways. | **Austria.** Federal Railways.



Belgium. National Railways Co. | **Switzerland.** Federal Railways. | **Denmark.** State Railways. | **Sweden.** State Railways.



——— = International trade. - - - - - - = Railway goods traffic.

Goods traffic receipts.

(In millions, in the currency of the various countries concerned.)

	1929	1930	1931	1932
Deutsche Reichsbahn	3 358.38 100.0	2 737.42 81.5	2.229.02 66.4	1 667.26 49.6
French main-line railways	11 906.21 100.0	11 753.98 98.7	10 530.95 88.4	9 110.32 76.5
Italian State Railways	2 962.69 100.0	2 653.73 89.6	2 159.55 72.9	1 833.41 61.9
Austrian Federal Railways	431.74 100.0	383.38 88.8	331.66 76.8	273.64 63.4
Belgian National Railways Company.	2 613.80 100.0	2 495.83 95.5	2 169.91 83.0	1 663.16 63.6
Netherlands Railways	91.30 100.0	84.74 92.8	79.95 87.6	66.67 73.0
British main-line railways	103.52 100.0	96.51 93.2	87.80 84.8	78.90 76.2
Swiss Federal Railways	232.09 100.0	218.61 94.2	210.08 90.5	183.47 79.1
Danish State Railways	50.79 100.0	53.27 104.9	51.13 100.7	45.76 90.1
Swedish State Railways	130.89 100.0	119.34 91.2	101.85 77.8	81.57 62.3

Changes in operating receipts.

(In millions, in the currency of the various countries concerned.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	5 353.83 100.0	4 570.32 85.4	3 848.67 71.9	2 934.32 54.8
French main-line railways	15 907.71 100.0	15 823.43 99.5	14 391.97 90.5	12 268 82 77.1
Italian State Railways	4 980.70 100.0	4 600.07 92.4	3 853.47 77.4	3 345.88 67.2
Austrian Federal Railways	704.72 100.0	665.25 94.4	550.78 78.2	474.69 67.4
Belgian National Railways Company.	3 546.69 100.0	3 528.54 99.5	3 090.73 87.1	2 451.98 69.1
Netherlands Railways	180.78 100.0	175.51 97.1	164.30 90.9	139.54 77.2
British main-line railways	182.78 100.0	172.62 94.4	158.50 86.7	145.34 79.5
Swiss Federal Railways	413.82 100.0	402.89 97.4	386.93 93.5	342.95 82.9
Danish State Railways	112.62 100.0	115.17 102.3	114.09 101.3	107.08 95.1
Swedish State Railways	210.76 100.0	201.58 95.6	181.23 86.0	166.15 78.8

Experience has proved that when the traffic falls off, the operating costs of a railway cannot at once be made to agree with the reduced receipts, for technical operating and administrative reasons, and this is clearly brought out when comparing the changes in receipts and expenditure.

Changes in operating costs.

(In millions, in the currency of the various countries concerned.)

	1929	1930	1931	1932
Deutsche Reichsbahn	4 493.50	4 090.35	3 622.47	3 001.08
	100.0	91.0	80.6	66.8
French main-line railways	12 510.60	13 988.59	13 698.90	12 647.81
	100.0	111.8	109.5	101.1
Italian State Railways	4 379.83	4 124.73	3 573.49	3 218.47
	100.0	94.2	81.6	73.5
Austrian Federal Railways	669.49	656.17	589.09	508.80
	100.0	98.0	88.0	76.0
Belgian National Railways Company.	3 066.82	3 208.36	3 023.94	2 620.48
	100.0	104.6	98.6	85.4
Netherlands Railways	130.17	128.82	127.00	117.23
	100.0	99.0	97.6	90.1
British main-line railways	143.93	139.48	128.54	121.28
	100.0	96.9	89.3	84.3
Swiss Federal Railways	280.38	291.42	283.28	273.30
	100.0	103.9	101.0	97.5
Danish State Railways	109.94	115.55	117.29	112.52
	100.0	105.1	106.7	102.3
Swedish State Railways	161.50	157.37	156.64	153.29
	100.0	97.4	97.0	94.9

Although at the beginning of the economic crisis there was an immediate corresponding decrease in the operating receipts, this table shows that the operating costs at first continued to increase or else were only cut down very slightly. Most of the railways were not able to make any appeciable reduction in their operating costs until 1930, after which such reductions were carried out on a larger scale than previously.

The extent to which the different railway companies have adapted their costs to their diminished receipts is shown very clearly in the following table which gives the percentage differences in the operating receipts and costs for 1929 and 1932 :

	Operating receipts.	*Operating costs.*
	%	%
Deutsche Reichsbahn	— 45.2	— 33.2
French main-line railways	— 22.9	+ 1.1
Italian State Railways	— 32.8	— 26.5
Austrian Federal Railways	— 32.6	— 24.0
Belgian National Railways Company	— 30.9	— 14.6
Netherlands Railways	— 22.8	— 9.9
British main-line railways	— 20.5	— 15.7
Swiss Federal Railways	— 17.1	— 2.5
Danish State Railways	— 4.9	+ 2.3
Swedish State Railways	— 21.2	— 5.1

A comparison of the operating costs in 1929 and 1932 alone will not make it possible to judge how far a railway has adapted itself to the new economic situation. It must be also remembered that certain companies had already begun at an earlier date to cut down their operating costs, which made it harder for them to make new savings between 1929 and 1932. The wide differences in the percentage reductions must also be attributed in part to the fact that the way the expenditure is divided as between capital and operating costs varies much from one railway to another.

Net profits.

(In millions, in the currency of the various countries concerned.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	860.33 100.0	479.97 55.8	226.20 26.3	— 66.76 ...
French main-line railways	3 397.11 100.0	1 834.84 54.0	693.07 20.4	— 378.99 ...
Italian State Railways	600.87 100.0	475.34 79.1	279.98 46.6	127.41 21.2
Austrian Federal Railways	35.23 100.0	9.08 25.8	— 38.31 ...	— 34.11 ...
Belgian National Railways Co.	479.87 100.0	320.18 66.7	66.79 13.9	— 168.50 ...
Netherlands Railways	50.61 100.0	46.69 92.3	37.30 73.7	22.31 44.1
British main-line railways	38.85 100.0	33.14 85.3	29.96 77.1	24.06 61.9
Swiss Federal Railways	133.44 100.0	111.47 83.5	103.65 77.7	69.65 52.2
Danish State Railways	2.68 100.0	— 0.38 ...	— 3.20 ...	— 5.44 ...
Swedish State Railways	49.26 100.0	44.21 89.7	24.59 49.9	12.86 26.1

The unfavourable movement of the receipts and costs since 1929 has led to a decrease in the operating receipts on all the railways. By 1930, the Danish State Railways could not meet their operating costs by the operating receipts. In the following year, the costs on the Austrian Federal Railways likewise exceeded the receipts. In 1932, the Deutsche Reichsbahn, the French main-line railways, and the Belgian National Railways Company all had a considerable operating deficit, while the balance-sheets of all the other railways showed at the best much smaller profits than during the year 1929.

Operating coefficients.

If the following table of operating coefficients be taken as a criterion of the economic results of railway operation, it shows very clearly that these have declined year by year. But here again the different methods as generally used by the railways or during the years under comparison in making up their accounts must not be overlooked, as they affect the operating ratio and the growth therof.

Operating coefficients.

—	1929	1930	1931	1932
Deutsche Reichsbahn	83.93	89.50	94.12	102.28
French main-line railways	78.64	88.40	95.18	103.09
Italian State Railways	87.94	89.66	92.73	96.19
Austrian Federal Railways	95.00	98.64	106.96	107.19
Belgian National Railways Co.	86.46	90.93	97.84	106.87
Netherlands Railways	72.00	73.40	77.30	84.01
British main-line railways	78.74	80.80	81.10	83.45
Swiss Federal Railways	67.76	72.33	73.21	79.69
Danish State Railways	97.62	100.32	102.80	105.08
Swedish State Railways	76.62	78.07	86.43	92.26

The comparative changes of passenger traffic expressed in passenger-miles show that in spite of the decline in traffic the mileage at first increased on all the railways. During the last two years only has there been any reduction on some railways, while on others, mainly because of increased competition, the

Changes in passenger train mileage.

(In millions of train-miles.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	259.35 100.0	262.30 101.4	261.81 100.9	259.11 99.9
French main-line railways	166.29 100.0	170.94 102.8	173.53 104.4	168.77 101.5
Italian State Railways	53.87 100.0	57.07 105.9	55.94 103.8	57.14 106.1
Austrian Federal Railways	20.97 100.0	21.56 102.8	20.98 100.0	19.82 94.5
Belgian National Railways Co.	26.34 100.0	27.84 105.7	27.47 104.3	27.75 105.4
Netherlands Railways	24.05 100.0	24.56 102.1	25.05 104.2	25.21 104.8
British main-line railways	249.56 100.0	250.90 100.5	247.17 99.0	247.56 99.2
Swiss Federal Railways	16.75 100.0	17.44 104.1	17.77 106.1	17.83 106.5
Danish State Railways	11.09 100.0	12.05 108.7	11.09 100.0	11.23 101.3
Swedish State Railways	12.56 100.0	13.56 108.0	13.99 111.4	14.48 115.3

number of passenger trains has been still further increased over the whole of the period in question.

Changes in goods train mileage.

(In millions of train-miles.)

—	1929	1930	1931	1932
Deutsche Reichsbahn	161.42	147.27	132.29	118.42
	100.0	91.2	82.0	73.4
French main-line railways	110.59	108.24	98.36	87.40
	100.0	100.2	88.9	79.0
Italian State Railways	36.36	33.44	26.39	25.97
	100.0	92.0	72.6	71.4
Austrian Federal Railways	13.65	12.71	11.73	9.51
	100.0	93.1	85.9	69.7
Belgian National Railways Co.	19.82	17.90	15.90	12.58
	100.0	90.3	79.3	63.5
Netherlands Railways	9.67	9.60	9.07	8.56
	100.0	99.3	93.8	88.5
British main-line railways	139.59	135.00	126.81	119.58
	100.0	96.7	90.8	85.7
Swiss Federal Railways	7.74	7.80	7.45	7.41
	100.0	100.8	96.2	90.9
Danish State Railways	2.47	2.73	4.09	4.01
	100.0	110.6	165.7	162.5
Swedish State Railways	6.98	6.96	6.89	6.40
	100.0	99.7	98.7	91.6

It will be noticed that on most railways the decline in traffic has led to a much greater decrease in mileage than in the case of passenger services. No railway, however, has as yet found it possible to adapt itself completely to the new state of affairs. The reason is that, in the case of goods traffic even more than passenger traffic, motor competition must be taken into account.

C. — Signs of the end of the European economic crisis and its reaction on the railways.

Various signs seem to point to the fact that in several countries of Europe the economic crisis, at least in so far as it affects the traffic, reached its peak in 1932 and since that time has become slightly less serious. Then too, world prices of certain classes of goods show a certain increase. In Germany, Great Britain, France, Switzerland, Austria, Lithuania and Norway an increase in the tonnage carried has been noted since this date, and in part also in the railway receipts for passenger or goods traffic, and sometimes even in both.

True this improvement varies considerably and the situation is still very different from what it was in 1929.

In other countries, on the other hand, the first signs of an improvement in the economic situation and the traffic conditions had not appeared in 1933 and 1934, or have only been altogether insignificant. In some cases even, at least during 1933, the depression has continued to become more serious. In fact the aspect of the general economic

situation and the traffic conditions has varied much more since 1932 in the various countries of Europe than it did in the two preceding years. No definitive conclusion can, however, be reached until complete statistical data for the years 1933 and 1934 are also available.

It would be outside the scope of this study, as well as premature at the present time, to consider what has been the principal cause of this first beginning of an improved economic situation and if in consequence the countries and railways of Europe can count upon a prolonged recovery in trade. But it is indisputable that, as in the case of the birth and growth of the economic crisis, so in overcoming it, the political situation in the various countries and international relations in Europe and between Europe and the other countries of the world have a very important part to play. There is also reason to think that the economic crisis will be more easily overcome in those countries where the burdens upon production are less heavy. Such burdens include not only taxes and other charges with which the State encumbers the general economy of the country, but above all the wages paid.

It is true that the improvement visible to-day in various countries, particularly in its reaction upon the railway, has only been brought about by remedies applied to an accidental phase, rather than to the causes, of the world economic crisis, and the increase in the quantity of transport has only been obtained for the most part by rates reductions.

In so far as the European crisis has been caused by essential modifications in world economics, the European railways will continue to feel its results for a long time. The industrialisation of countries in other continents, seconded by the world war, has led more and more to such countries themselves producing many goods and machines formerly supplied by Europe. This change in world economics, that is to say the taking over of what was more or less a monopoly, the export trade of Europe to practically all the other countries of the world, merits our attention particularly as the competition from the imports of these countries which used to take our exports is already being felt in Europe itself. The changes which have taken place in the structure of the economic systems of various countries also have the effect of decreasing transport by rail rather than increasing it.

CHAPTER II

The railway crisis considered as a traffic crisis and the possibility of lessening it.

A. — The increase in motor transport as a cause of the traffic crisis.

1. General remarks.

The crisis which the railways of Europe have been passing through for some years would not be completely understood if it were considered solely as a result of the general economic depression. Besides this latter, the existence of a crisis peculiar to the transport industry itself, due to the increase of road motor traffic, must also be noted. It is true that conditions are very far from being identical in this respect in the different States, or within the same countries for the different railways. In particular, there is a very marked difference in degree between the effects of motor competition on the existing traffic and the financial situation of each railway. There is also a difference between the chances the railways themselves have of profiting by motorization that is to say of making use of feeder services directly or indirectly by means of motor transport and of using the motor themselves to extend their field of action, or to organise their

working more economically. The main factors to be considered in this respect are :

a) The *size* and *geographical peculiarities* of the country;

b) The *extent* and *density of the railway system* belonging to each company, as well as of the railway system of the country in question as a whole;

c) The nature and extent of *road services* which can be worked by motors;

d) The structure and the position of the economic life of each country, i. e. the way the land is divided up between agriculture, industry and commerce;

e) The existing laws concerning the operation of railways on the one hand, and of motor transport undertakings on the other, and finally

f) The financial charges of the two methods of transport for the use of public facilities, and of the motor undertakings for the construction and upkeep of the roads.

Generally speaking, it can be stated that the harmful effects the railway suffers from as a result of the development of motor transport are in proportion to the density of the road and railway systems, and as the field of activity of motor vehicles, which varies with the extent of the country and above all according to the condition of the roads and the economic situation, approaches that of the average distance of railway transport. Thus a small railway system in a region with heavy traffic or where the roads are good and in good order will feel the effects of extended motor transport development more severely.

During the first ten years after the war, conditions were so favourable not only to world economy as a whole, but also to the economic life of nearly all the countries of Europe, that some railways as well as the greater part of the economic world, public opinion and the various governments had not appreciated the extent and far-reaching effects of motor competition. Moreover when, because of the change in economic conditions, the losses to railway traffic due to the motor became more clearly visible, in many cases and even on the railways themselves, the erroneous idea persisted that these losses were only disquieting because the economic situation had become so bad at the same time. It was only gradually and after the particular character of motor transport and its extension had been carefully gone into that it was recognised that any improvement in the economic situation would most likely cause an even greater increase in road traffic than in railway traffic, and that above all, in countries where there is already a great deal of motor traffic, any technical improvement in motor vehicles or decrease in the operating costs would of necessity encourage a further extension of motor transport.

2. The effects of competition from the different kinds of motor transport on railway passenger and goods traffic.

The amount of loss the motor causes the railway to suffer at the present time can, of course, only be estimated approximately. According to published estimates it varies,

in the case of passenger traffic from 5 to 30 %,

in the case of goods traffic from 3 to 20 %,

these figures being based on the actual traffic handled and the rates in force on the railway. On some railways the loss in passenger traffic is the greatest, on others the goods traffic has suffered most. But these are not the only effects of motor competition upon the finances of the railway. *To the losses due to traffic being diverted must be added*

a) losses due to lowering the rates because of motor competition, and

b) additional expenditure incurred in carrying out the service to the extent it is due solely to motor competition and does not at the same time promote an in-

crease in the traffic not affected by such competition.

The losses suffered by the railways in the case of passenger traffic are due principally to the growth in the number of private cars, and latterly of motor cycles. The railway has no means of protecting itself against this kind of motor traffic which is most in accordance with the nature of motor transport and most frequently is not affected by any considerations of an economic nature. Then too the public authorities can take no measures to restrict this kind of motor transport.

In most countries the losses the railways suffer through *bus services* are much less. The railways even profit from many bus services as they act as feeders or at least make it possible to abolish unproductive railway services. It is true that, generally speaking, this has been the result of the government of most countries taking measures in connection with transport of this kind in a relatively satisfactorily rapid and efficacious way, otherwise the bus services would also have developed into competitive transport to a much greater extent.

This is also proved by the way in which *special bus services and excursions in motor lorries temporarily adapted for passenger transport* have developed. It is these two methods of passenger transport which have developed to a very remarkable extent during the last few years in several countries. Doubtless, not all transports of this kind can be considered as competitive, even when they run parallel to the railway; nonetheless, such special services taken as a whole have already had an appreciably adverse effect on the railway traffic.

In the case of *goods traffic*, the *losses* which the railways suffer from motor transport, *expressed in tons*, are as a rule *greatest in the case of short-distance transport*. Yet in many cases on the main line railways, such losses are less extensive than those, even smaller in respect of tonnage, for the long-distance traffic. This is chiefly due to the fact that, the shorter the distance, the smaller as a rule the excess of receipts for a given transport over the additional expenditure involved in carrying out this transport, i. e. the amount available to meet the general operating costs and also, if need be, to lower the cost of other transport.

The losses suffered by the railways in short-distance goods traffic are chiefly due to the extension of the « Werkverkehr » i. e. of the practice of the industrial, agricultural or commercial undertakings making use of their own motor lorries. In comparison with such transport, that carried out by professional hauliers or cartage firms is as a rule of secondary importance, not only within the district served but in surrounding areas.

The *conditions governing the transport of goods over long distances* are quite different in all countries where there is much motor lorry traffic. Properly speaking, the « Werkverkehr » loses much of its importance as the distance increases in comparison with the goods rates. In this case, the additional use of vehicles belonging to a private transport undertaking, and in particular for the transport of foreign goods on the return working varies in importance from one country to another. But everywhere, the greater the distance, *the greater the competition to the railway from professional motor lorry undertakings*. The greater part of this lorry transport is not carried out by large transport firms nor by haulage contractors using their own vehicles. On the contrary, long-distance goods transport is mainly carried out by small hauliers who work either on behalf of the consignors properly speaking, or on behalf of given haulage firms. In most of the larger countries it is these particular

motor services organised by transport agencies but carried out by small hauliers operating over varying runs which cause the railways the greatest losses.

3. The causes of long-distance motor lorry competition and the extent of its effects.

With a few negligeable exceptions, in the case of long-distance transport by motor lorry, and in particular the services of the firms mentioned above, clients do not desert the railway on account of the faster transport offered, or the greater convenience in other respects which the lorry can offer thanks to its particular technical and economical conditions. In nearly every case, they are won over by lower rates made possible with the motor lorry at the present time, in spite of the fact that the cost price is in general higher, because of

a) the structure of the railway rates, especially devised to meet economic needs,

b) the *preliminary legal restrictions falling on the railway* particularly as regards rates, operation and transport,

c) in some countries *taxes and other burdens falling more heavily on the railway* than on the motor lorry, or, inversely,

d) the *insufficient contribution made by motor lorries to the cost of making and keeping up the roads* used by them.

It should be noted that motor competition affects almost solely those goods which pay the higher rates, and takes place preferably between places with the heaviest traffic which in consequence are also the most advantageous to the railway from the point of view of cost.

On the other hand, if the transport agents find it to their interest to favour transport by motor lorry, preferring this to railway transport, the main reason is that as a rule they can bring pressure to bear on the rates offered by hauliers, the economic existence of the latter being dependent on the former, so that the intermediate profits to be made are appreciably higher than they could get if they used the railway.

Now, *protection of long-distance railway traffic in highly rated goods* against this *competition waged by means of reduced rates* is desirable *not only in the financial interest of the railways themselves* but also *in the interest of the general economy of the State itself*. The fact that motor lorry transport has seized a large part of such transport would force the railways at the same time as they lower the rates to get such traffic back, to do without the excess receipts obtained up to the present on such traffic alone; now these excesses are indispensable both for the lower rates, required for reasons of political economy, for carrying raw materials, and also for maintaining regular services in regions with very little traffic.

4. The railway, the economic, and the governmental points of view on railway and road transport.

The railways only gradually came to understand the rail and road transport problem, its nature and its results. It was not at first appreciated that the interest of the public in motor transport was in many cases not due solely, or sometimes not at all, to the technical characteristics of the new method of transport the chief advantages of which are :

a) it is *not tied down to a given route* reserved particularly for it, and consequently

b) is *completely free from the point of view of carrying out transport* within a given time, and

c) thus *can meet the various traffic requirements without breaking load.*

As a general rule it was not sufficiently appreciated at the beginning that *recourse was had to the motor partly or even wholly* because of :

a) the *advantage* the individual can

derive from the fact that *motor transport comes under other laws* and taxation than railway transport, and

b) contrary to the case with railway transport, these transports can be carried out by *small private undertakings* and in particular can be operated *by the user himself as private services.*

Precisely on account of these circumstances, in the problem of *transport by rail or road,* purely technical and economic factors play little part in deciding *under what conditions* and to what extent *the transport should* rationally *be carried out by any particular method.* On the contrary, more and more attention is being given to the question of *public economy and the transport policy* to learn up to what point it is advantageous for the community, and, generally speaking, allowable that :

a) the uniformity and *equality* enforced up to the present in the public railway services on the *transport conditions* give place to *discrimination and diversity,* and

b) the *public services* available to all be replaced by *privately-operated transport,* the extent and conditions of which are determined by the financial interests of the undertaking or the user, without regard for the interests of the community.

There is no doubt that since the beginning of the general economic crisis, even outside railway circles, the nature of the problem and the way it should be enunciated have been more clearly understood. It should be noted with satisfaction that from year to year the economic circles have gained a clearer appreciation of the question of railway and road motor transport, in particular also as regards future developments. More or less parallel with this, the governments are becoming more and more disposed to take the new situation caused by motoring into account, by means of legal measures.

In this respect, special attention must be called to the *Commission of Experts set up by the International Chamber of Commerce* in order to conduct an enquiry into the question of railway and road motor transport. A detailed preliminary report was issued on the question at the end of 1933. The value of these investigations resides first of all :

a) in the very close *study* of *the present situation* in the different countries and *its causes* from the double point of view of conditions of fact and of right and also

b) in a detailed report of the *demands* made from the point of view of the *general economy,* and finally

c) in a more or less complete *enumeration* of the theoretical possibilities of *solving* the question of rail and road transport (completely free competition between the two methods of transport, common monopoly or separate monopolies for road and rail, regulated competition), as well as

d) arguments for and against each solution.

It is noticeable that the results of the enquiry made by the above mentioned Commission, as regards the elucidation of facts and their causes, are completely in agreement with the point of view expressed by most of the European railways. Moreover, there is also remarkable agreement in appreciating the economic interests which must be taken into account in solving the problem. The railways have likewise recognised the general economic interest in keeping the proportion of transport charges to the total expenditure as low as possible. Thus, in appreciating the different solutions to the question, the opinions of the two parties are very similar. It is true that, because of the diversity of circumstances, the railways are not quite of the same opinion as the Commission of experts on the utility and possibility of applying the different measures proposed by the latter, and in particular

in regard to the limitations as to area which should reasonably be attached to their application. The two extreme solutions, i. e. completely free competition of rail and road against each other for all distances, and the introduction of a complete legal monopoly for the railways or merely for their transports from one district to another, are both rejected by all the railways of Europe.

Generally speaking *the opinion of most of the different railway* administrations seems to be :

a) that they should be allowed *more freedom, in principle,* than up to the present, in so far as *the community can no longer be allowed a decisive interest in keeping them to their old strict obligations* and when, if these obligations were maintained unchanged, it would necessarily lead to the railway losing those transports it can carry as well as the motor, and at a lower cost price, but that

b) in so far as the community is interested in maintaining an efficient public transport service, the *competition of motor services* belonging to other undertakings *must be restricted.*

The first condition is chiefly justified because the provision of equal transport facilities for all concerned, which was the main object of the special obligations imposed on the railways, has lost interest to-day, because of the multiplication of privately-owned motor vehicles. But, precisely because of the new possibilities offered by the motor, the public can do without the special protection which was the object of the special obligations laid on the railway. In most of the countries and railways of Europe the application of this idea would mean that the obligations imposed on the railways as regards rates, operating conditions and transport would be lessened in the case of short-distance transport. On the other hand, the motor vehicle could carry out much transport in this field in the service of the railway, such transports having been carried by rail up to the present, though they could be carried out more satisfactorily and sometimes more economically by road.

In long-distance transport, on the contrary and for a long time to come, in spite of the extension in private motor vehicle traffic, a large part of the users probably will have to continue to use the public services. In this case consequently the competition of privately-owned motor vehicles should be restricted according as their illicit extension would menace the public transport services.

What measures should be taken to achieve this object and after what distances the public services should be protected will be replied to differently by the various countries.

According to the circumstances, it might be sufficient to submit the motor services of other undertakings, which are in competition with the railways, to additional taxation and to certain regulations, without directly restricting the number of private firms taking part in such competition or controlling their activities. At times, on the other hand, a restriction in the number of, and direct control over the motor services, are indispensable, or the organic joining up of these services with the railways may be necessary, until a certain transport monopoly has been formed, which is also necessary in the interests of those firms engaged in motor services and for maintaining a good motor service.

That State railways as well as private companies should endeavour to improve their railway services by all the means economically possible so that they may be better able to withstand motor competition is moreover in agreement with the principles laid down by the Commission of Experts of the International Chamber of Commerce. However, in the presence of competition depending very largely upon a method of transport which technically offers

door to door transport, the operators of which are private firms making full use of the established principle of freedom of action, naturally enough the steps taken by the railways to perfect their services cannot be limited exclusively to technical questions and to the organisation and rating of railway transport properly speaking. Other measures must also be taken such as organising the auxiliary services which preceed or follow the actual railway journey.

5. Historical review of the steps taken by the States and railways to solve the question of rail and road transport.

In the next paragraphs of this chapter we intend to show, by means of a review of the measures taken during the last few years in various countries by the government or the railways, the progress made in solving the question of rail and road transport since the beginning of the economic crisis. It appears useful, however, to give first a brief summary which, without going into details, will show in chronological order the different stages in the progress made up to the present.

In the first place, it is evident that everywhere the attempts made to solve the problem depend exclusively upon protective steps taken by the railways themselves. As it was thought that the public only made use of motor transport because it was faster, the steps first taken stressed the idea of accelerating railway transport. Only after 1928 did the protective measures affect the rates, after it had been recognised that, particularly in the case of goods traffic, motor competition is often simply a question of price. The difficulties which the railways came up against in this struggle made them appreciate for the first time the inequality of the legal and practical conditions under which the competition of the two methods of transport was being carried out. In consequence, to minimise these inequalities, they extended on the one hand the protective measures beyond the actual rail traffic, and, on the other hand, they asked the government to modify the conditions of competition by legal measures.

In the latter connection, the first suggestions put forward by the railways aimed at lessening their legal obligations in addition to imposing heavier taxation on the automobile. Generally speaking, it was only at a later date that the railways found it would be in their interest were the regulations affecting the granting of concessions made more stringent from the point of view of motor competition. At first, they did not go farther than considering the institution of some control over motor transport, existing independently side by side with the railway, the object of such control being to put an end to inadmissible competition. Only during the last two years, when the insufficiency and even the impractibility of applying such a solution has been brought home to them, has the tendency been more and more to make the aim of regulations on concessions the achieving of co-ordination between the two methods of transport, which otherwise is impossible. The interest of the railways in such a solution, as well as the readiness of motor transport undertakings to accept it, have grown more or less in proportion with the extent to which the railways, while continuing to improve their services and local auxiliary organisations, have taken an active part in road transport.

B. — Review of the measures taken or suggested in the various fields.

1. Changes in laws affecting motor transport concessions in the different European countries.

It must first of all be pointed out that the review hereafter will not deal with legal and administrative prescriptions

of a purely preventive or disciplinary nature concerning the admission of motor vehicles into traffic or the obtaining of a driving license. For our purpose the expression « laws affecting concessions » will only include the legal or administrative prescriptions relating to the granting or refusing of permission to carry out a given kind of motor transport service, i.e. State control, also extending to the way the motor vehicles are used. According to the above, by concession must be understood not only the official authorisation of a motor transport undertaking, carrying with it certain rights of monopoly, but also all official permission to make use of motor vehicles in a given way, if from the beginning this is only granted under certain given conditions or can be withdrawn eventually in given cases.

A few years ago, legislation on concessions in nearly all European countries only dealt with motor transport carried out publicly as a regular service. Even when the legal prescriptions did not refer expressly to *passenger traffic alone,* as was and still is the case in many countries, on account of this restriction they were not of much importance in the case of goods traffic. But also in the case of passenger traffic in countries with heavy motor traffic, the laws concerning the legal concession of regular services only have become more and more insufficient. Consequently, during the last few years more and more countries have decided to make *special (occasional) services* also depend upon certain concession conditions, at least when such transports are carried out by means of trade vehicles and by professional carriers. In many countries, there are also regulations restricting or forbidding altogether the transport of passengers in motor lorries.

As the *competition of motor lorries* increased and became more widely recognised as a menace to the railways and public services, the need for efficacious laws to control such transports became more and more obvious. Soon after the beginning of the economic crisis, the railways themselves as well as the governments recognised the fact that legislation on concessions, *capable of putting an end to competition,* must of necessity *cover all irregular goods transport services* including the transport for reward of goods in vehicles belonging to agricultural, industrial or commercial undertakings. It was also recognised that the laws must take into account the fact that *motor lorry competition,* at least in the case of long-distance transport, is above all *a question of carriage charges.* Now, there would be serious difficulty in drawing up regulations of practical utility in these respects if the principle that the two methods of transport are distinct and separate undertakings competing with each other in offering their services to the public is adhered to.

The laws of several countries have solved the question of unfair competition by *subjecting irregular services by motor lorry to a concession, the grant of which depends upon the need for such a service,* without controlling the organisation of the motor service. It must be noted in this connection that, though it is relatively easy to decide upon the need for a service in the case of one operated over a regular route, the difficulties are considerable in the case of a service carried out at irregular intervals over various routes. When dealing with a wide area, it is absolutely impossible to insist upon a preliminary authorisation being obtained for an occasional run. Consequently the *need* for such a service can in this case only mean a decision as to whether the number of firms and vehicles in use is sufficient to meet the requirements of the users or not. Once again any conclusion is difficult as all motor services are not organised on the same lines. The demands of the consignors, which determine the need

for the service, are to a large extent based upon the rates offered by the motor transport services. We are, therefore, forced to conclude that, even when the need for the new service is gone into, the granting of concessions for occasional goods services must of necessity presume *some definite attitude of the State towards the fixing of the rates.* The question is to put an end to the under-cutting of rates by the motor services which is undermining the railway rating system.

In many countries laws have been passed to achieve the *State control* now recognised as necessary over motor transport *rates in an indirect way, by taxes and obligations of various kinds,* and in particular by regulations requiring motor transport firms to keep proper accounts, to keep their vehicles in a proper state of repair, and to employ them and their staff in a proper manner, and to be adequately insured against accidents.

The introduction of taxation with this object is however of dubious utility. An inclusive tax on each motor vehicle that does not take into account the volume of traffic handled, nor even, in many cases, the kind of service in which it is used, would seem to be of little use in preventing unfair competition. Up to a certain point, on the contrary, it would more likely increase competition, seeing that the tax is less as the mileage increases. On the other hand, a tax on fuel or tyres does not merely make no distinction between economically justifiable motor services and the parasitic services, but has the additional drawback that its efficacy is lessened every time the price of fuel or tyres falls. In the same way, all taxation on transport levied as a *transport or transmission tax,* although it can be restricted to the motor lorry traffic to be dealt with, requires a complicated control service to be set up if it is to be of efficient. The control required to see that the other measures enumerated above are carried out is even more complicated and much more costly.

In many countries an attempt has been made to influence the cost of transport by motor lorry by fixing definite minimum rates, laid down by the State. The efficacy of such a measure depends to a great extent upon the goodwill and feeling of responsibility towards the State and community of those concerned. They are asked to observe regulations often against their own interests. Consequently in such cases a very strict control, both on the road and at the offices or stores of those concerned, is particularly indispensable. The information collected in Germany shows that, at least in a large country, with a heavy population, and a well-developed road system, it is quite impossible to achieve any sort of efficacious control as it is so often possible to avoid the regulations both directly and indirectly.

The third way of controlling the rates of motor transport in order to stop the competition which is striking at the roots of the railway rating system is to *make agreements between the motor transport undertakings and the railway.* By means of such agreements it is possible at one and the same time to divide up the traffic between rail and road in an economical and logical fashion, and to put the road motor transport undertakings in their proper place in the general organisation of public transport services. Experience has shown, however, that not all agreements of this kind have a practical value, or, in particular, a lasting value unless at the same time the State guarantees them from interference by a third party.

In view of the unsatisfactory results obtained by other methods, the laws of the different countries concerned seem to tend more and more to the last named method. In many countries, too, this

question is also affected by the growing interest of the road motor transport firms to put an end to the rates war. Many of these firms have already seen, at least to some extent, that in the end they must be defeated in this fight if only because the railway rates will be progressively reduced until they are so close to the lowest prices the road firms can offer as to put a complete stop to their activities. For this very reason the State obviously is interested in an arrangement which, thanks to the agreement come to with the railway, assures the economic existence of the road transport firms and keeps the motor transport industry in a profitable condition.

Another problem as regards the legislation on concessions is to know whether, and if need be *to what extent, the motor lorry traffic for reward from one district to another shall be free of obligations imposed by the concessions.* As conditions vary widely from one country to another there will doubtless be a great difference in the replies to this question, so that the laws passed in this connection will differ a good deal.

A rigorous distinction must be made between the above question and that of knowing up to what point the *traffic should preferably be left to the motor in given districts,* or preferably or exclusively to the *railway* for transport over given distances, this being decided either by the laws themselves, or by agreements relating to the division of the traffic when the concession is granted. On this point it is likely that the laws will differ in the various countries, according to the existing circumstances.

There is finally the question of deciding whether *purely private transport* shall have any restrictions imposed upon it, which is so far answered in the negative by nearly every State. It should not be forgotten, however, that in the end this traffic likewise may prove a menace to the public transport services.

Great Britain.

Until 1930, there was in fact no legislation in force in Great Britain with regard to concessions, either for passenger or goods traffic. There were, however, certain regulations of a purely local character covering the case of bus services operated as public services. All goods traffic by motor lorry was completely free from restrictions until 1934.

The law of 1930 first of all regulated *motor passenger transport* concessions. When considering requests for concessions, the necessity for the new service was first of all investigated. All public bus services are submitted to these regulations. England and Scotland have been divided up into 13 traffic areas. In each of these areas, there is a special Traffic Commission and a Traffic Commissioner to see that the regulations are observed and applied, as well as the other prescriptions laid down by the same law for goods traffic as regards the condition of the motor vehicles used, the maximum speeds allowed, the qualifications and working hours of the driving staff, etc...

The railways have the right to oppose the introduction of new services by other firms, and the above mentioned authorities have to deal with their objections. However the railways are given no privileges when carrying out motor transport services themselves. If they wish to organise a motor service, they must submit, in principle, to the same regulations as other undertakings.

A new law concerning goods traffic came into force on the 1st January 1934. In addition to increasing the taxes paid by motor lorry services, especially in the form of higher licence taxes, this law introduced : obligatory concession for all transport by motor lorry running outside the local areas, including private transport. Three kinds of licence are granted :

« *A* » licences for firms engaged in haulage work on behalf of a third party;

« *B* » licences for undertakings whose motor vehicles are intended first of all to be used for the business of the firm itself, but also carry other people's good for payment;

« *C* » licences for purely private transport.

When a C licence is issued, no preliminary investigation is made into the need for the service. Such a concession is never refused. But it can be limited, according to the trade of the firm asking for the licence, to certain kinds of goods and to certain routes or traffic zones.

This latter restriction can also apply to the issuing of a B licence. On the other hand, an A licence is only granted for all kinds of goods and the whole country. Unlike a C licence, A and B licences are only issued after the need for the new service has been established.

The law contains no clauses relating to the transport rates. In this connection, likewise, no restriction can be imposed when the concession is granted.

It is expected that prevention of unfair competition against the railways, which is the main object of the law, will be achieved in part by the restriction, in accordance with the new regulations on concessions, of the number of firms and vehicles taking part in the road motor transport services, but above all by the additional financial charges falling on motor lorries. These additional charges are partly direct, by means of the increased taxes collected from them, and partly due to the more rigorous control imposed by the law of 1930 on the condition of the vehicles and the qualifications and working hours of the staff.

The practical success of the English laws on concessions will doubtless depend, in actual practice, on the way in which the enquiries into the need for new services and the control over motor lorry transport are carried out.

Ireland.

In Ireland, likewise, actual legislation on concessions has only been passed within the last few years.

In the case of *passenger traffic,* apart from the regular services, occasional services operated by haulage firms have now to obtain a concession as well. Demands for a concession can be refused for reasons of public interest. In addition, the granting of a concession can be subjected to certain conditions, such as a minimum number of services, fixed timetables, transport rates, and the working hours of the staff.

In the case of *goods traffic,* except for purely private transport and public carriers operating within 10 to 15 miles around some of the large towns, the 1933 Act makes it necessary to obtain a concession. This obligation also extends to public transport carried out by motor lorry at irregular intervals.

The law begins by making a distinction between existing services and proposed services, and then between the other transport services known as « authorised » services. The authorised firms, i.e. those authorised by royal decree or by the law to work the services, are in actual fact the Irish railways only. The other firms can only obtain a concession for the traffic handled by them previously, and for the same number of vehicles previously used for these services. As regards new traffic the other firms are only allowed to operate additional services if there is a real need for them and no railway wishes to work them. In addition, a concession granted to a firm not in the authorized undertakings can be limited to given districts or even to given kinds of goods.

All concessions carry with them the obligation to work the service and to carry. But, though fixed rates are not prescribed to the other firms, the autho-

rised undertakings have to submit maximum rates for approval.

The law also includes clauses relating to the taking over of other services by the authorised undertakings. In this case, these latter have to compensate not only the other firm, but within limits, the staff employed by it. The other firms can, for their part, ask for their services to be taken over and compensation paid if such services are threatened by the motor services of an authorised undertaking.

The information collected up to the present is naturally insufficient to judge definitely the practical value of this legislation. It is obviously intended, as it expressly states to some extent, to amalgamate the greater part of the motor lorry transport services of more than local interest, carried out professionally, under the auspices of the railway, without, however, protecting the railway traffic in any special way.

France.

Until the 1934 spring, there were no legal regulations dealing with concessions in France. In the case of both passenger and goods traffic, any one could set up regular services without any preliminary formalities. All that was necessary was a preliminary declaration to the authorities. Only in the case of motor services asking for a subsidy from the public funds was it stipulated that the granting of a concession was dependent upon certain conditions and obligations which as a rule concerned the rates and timetables of the transport in question and equal treatment for all users. This regulation was, however, of practical use only in districts with little traffic, where, as a rule, competition between the railway and the road is not very great and only affects passenger traffic.

The decree of the 19th April, 1934, first introduced obligatory concessions for all *public passenger and goods services* carried out by means of motor vehicles. According to this decree, all services must be considered as public services which are not solely at the disposal of a restricted number of people, but can be used by everyone upon payment. This applies indiscriminately to transports carried out either regularly over given routes, or irregularly according to various traffic requirements. On the other hand, passenger services against payment which only take place exceptionally are allowed to operate without a concession, as in the past.

Passenger and goods transport can only be authorised after a local agreement has been come to in respect of the division of the traffic between the motor carriers and the railway. The decree makes provision for the setting up of commissions known as Co-ordination Commissions, composed of representatives of the railways and public transport firms, under an independent president, and with financial advisers. Should they fail to agree among themselves, the matter is to be referred to arbitration. The agreements made between the railways and the public transport firms as well as the arbitration decisions come into effect only after approval by the Minister of Public Works. This approval can be subjected to certain conditions concerning, among other things, the rates, timetables, a certain obligation to operate and carry, and equality of treatment for all users.

Up to the present, two such agreements have been made, according to this decree, between railways and motor transport firms : these are the Rouen and Beauvais agreements. Both these agreements are mainly concerned with passenger traffic, but also make provision for goods traffic. According to these agreements, many small stations and certain sections of line of secondary

importance will be closed down as far as the passenger traffic is concerned and replaced by motor services. On the other hand, many motor services worked up to the present will be suppressed, and will be partly compensated by the railway. High-speed traffic between places which will continue to be served by the railways is, in principle, to be reserved exclusively for the railway. The motor passenger transport firms who come into this agreement will be grouped into joint stock companies.

It is naturally not yet possible to judge the value of this new French organisation. As experience has shown that most of the difficulties which occur concern goods traffic, we must wait and see first of all what agreements are made in this connection and the results thereof. The most noteworthy idea in this new legislation is the tendency to use it to limit within small districts the spheres of activity of the two methods of transport and then to develop collaboration between them in the duties assigned to each. Obviously, the new organisation endeavours to reserve, in principle, for the railway, long-distance traffic in both the passenger and goods services, or at least to retain the present-day rail borne traffic.

Spain.

At the present time, in Spain, a law passed in 1924 is still in force, which only makes concessions obligatory for regular public passenger and goods services. The concession is granted by the local authorities for given routes. It is generally agreed that this system has not given good results, first of all because it has given the right of monopoly to many small undertakings, some of which are not capable of giving adequate services, and then because it ignores all traffic of an irregular nature, and because, consequently, it is not of sufficient importance, in practice, in the case of goods transport. Owing to these obvious defects, the introduction of new regulations governing concessions has been under investigation for some time already, but the probable scope of these new regulations is not known at present.

Belgium.

A law passed in 1932 contained new regulations by which all *public motor passenger transport* services must obtain a concession, and firms desirous of operating them must be approved by the public authorities. The National Railways do not have to obtain authority for the motor services they set up between stations in place of train services.

A new bill of law is intended to make it necessary to obtain a concession for *all goods motor transport services* against payment. The authorisation can only be granted if there is a need for the new service. The organisation proposed by this new law is evidently similar to that in force in Great Britain since the beginning of this year. As in Great Britain, the chief remedy for competition is, according to this proposed Belgian law, to restrict the number of motor transport undertakings and the vehicles used by them, to increase, by means of taxation, the financial cost of motor transport, and to impose, if need be, such conditions upon the motor transport undertakings as will force them to adopt a really economic way of operating. The new Belgian bill likewise contains no clause relating to the rates charged. Nor does it prescribe any particular action on the part of the railways and the motor transport firms to achieve methodical collaboration.

Luxemburg.

The regulations in respect of concessions, which have been in force in that country for many years, only relate to

public motor passenger transport services. They have not been changed in recent years. Goods motor transport is absolutely unrestricted.

Holland.

In Holland also, up to the present, only passenger traffic worked as regular services has to obtain a concession, and goods traffic is absolutely unrestricted. However, the introduction of a system of concessions, together with an investigation into the need for the service, is under consideration for goods traffic likewise. As in Belgium, the system it is proposed to introduce is obviously inspired by the British methods. Consequently, in Holland likewise, the new organisation will be principally based on restricting the number of undertakings and that of the vehicles to be used in motor transport services, and on increasing the financial charges upon this transport. Another projected law is intended to set up a so-called transport fund to which all methods of transport should contribute. This fund would also be used to meet the expenses of certain railway services which up to the present the railways have had to pay for themselves.

Switzerland.

In the case of regular or occasional public *passenger traffic* carried in motor vehicles, the monopoly of working such services has for a long time, in Switzerland, been in the hands of the Confederation. The exclusive right is as a rule exercised by the Post Office Administration, which most frequently works the services itself; in certain cases, they are worked on behalf of the Post Office by paid contractors. In addition according to Swiss law, there are two forms of concession in respect of passenger traffic. The holder of an A concession is authorised to carry out a given traffic which the Post Office does not wish to deal with, the concession being granted, if need be, for a considerable time. On the other hand a B concession covers only a temporary service. In practice, it is mainly used in dealing with seasonal traffic.

In the case of *goods traffic,* there are no laws dealing with concessions in Switzerland. Latterly, however, the legislative bodies of the Confederation have passed some new regulations in agreement with the convention signed, in 1933, between the Federal Railways and the privately-owned Swiss railways on the one hand, and motor transport representatives on the other, and submitted with the approbation of the community, as a common proposal to the legislature.

The new law makes it necessary to obtain a concession in the case of all motor lorry transport exceeding a distance of 10 km. (6.2 miles) within a town area. Apart from this strictly limited area, only purely private transport is allowed and this as yet does not have to be authorised. No concession is granted until the need for the service has been investigated.

The law makes provision for two kinds of concession :

a) N concessions, only granted within an area of 30 km. (18.6 miles) for given services or traffic districts, but apart from this for all kinds of goods; and

b) S concessions, for given kinds of goods, such as furniture removals, perishable goods, etc... for which proof has been given that motor transport is essential.

This latter kind of concession is granted as a rule without any limitation as to the distance and for all traffic. A holder of an S concession is not allowed to do private work.

The holders of N concessions are members of an association, the new SESA, of which the Federal Railways and private Swiss railways are also members, as well as various associations

of users. In the future, the Federal Railways will deal exclusively with this association and its members for their motor transport. According to the agreements made, holders of N concessions will in the future carry out all goods transport for distances of less than 30 km. (18.6 miles) unless the consignor expressly asks for railway transport. In addition, it is intended to extend the ASTO service set up by the Swiss Federal Railways during recent years, by which the railway parcels services are worked by motor lorry over certain sections.

A particularly noteworthy point of this new legislation is the fact that, above distances of 30 km., the goods traffic, with the single exception of S concessions and purely private transport, is reserved not only for the railway but definitely for its railway services. Attention should also be called to the collaboration it is hoped to get between the railways and the private motor transport undertakings, to the preponderant part played by the Swiss Federal Railways in this common activity, and finally to the fact that they are giving up, in principle, taking part in motor lorry transport with their own vehicles.

Italy.

In Italy, only the regular public motor services are covered by legislation concerning concessions. It does not affect to any extent the goods traffic which, in this country, is nearly always worked by occasional transport services.

Germany.

Up to 1931, the legislation on concessions in force in Germany only made it necessary to obtain an authorisation in the case of regular motor services. These regulations applied to both passenger and goods traffic, but they were of practical value only in the case of passenger traffic. In this latter connection, the Post Office Administration always held a privileged position, as it was not required to obtain any official authority when organising passenger services.

By decree of the 6th October 1931, the legal prescriptions on concessions were modified in several details, and extended particularly in the case of goods traffic. In the case of *passenger traffic*, the old regulations were unaltered in principle, but completed, in the case of postal services, by giving the railways the right to veto new services.

As a change from the old state of affairs, in this decree the regulations on *goods traffic* are separate from those on passenger traffic. No distinction is made any longer between regular and occasional services, but instead between short and long-distance traffic. Transport over distances of not more than 50 km. (31 miles) comes under short-distance traffic. Such short-distance transport, as well as all private transport, does not have to be authorized by the authorities. Against this, all transport by motor lorry over distances of more than 50 km. (31 miles), whether operated professionally by transport firms, or occasionally in vehicles belonging to agricultural, industrial, or commercial undertakings, must obtain an authorisation. Although, as in the past, an authorisation to set up a new passenger service is only granted after investigation, according to the decree of 1931 all those who ask for an authorisation for goods traffic must receive one. In this case there is no need for an investigation into the need for such a service. The authorisation can be withdrawn if the firm abuses the confidence placed in it, and, still more so, if the legal and administrative regulations governing long-distance traffic are broken repeatedly. The most important of these regulations is that by which goods must only be transported over distances of more than 50 km. at given *minimum rates*, fixed

by the Minister of Transport and based on the railway rates.

However, the regulation of goods traffic in this way has proved insufficient to meet the situation and, to a great extent, it could not be enforced. Fixed minimum rates laid down by the authorities for motor transport firms as a remedy for competition were never adhered to, as such rates can be reduced in various ways, as well as indirectly, and this cannot be prevented, seeing how many firms there are and how impossible it is to control them efficiently. Consequently, the main object of the decree, i.e. the protection of the Reichsbahn and its rating system, has not been achieved. Nor was the other object of this decree, the putting of the motor transport industry on a sound basis, ever achieved.

Consequently, further measures have long been under consideration. In the case of *passenger traffic*, a new bill is now being drawn up. In view of the exceptionally large increase in special transport, firms wishing to operate such services in the future will have to obtain the necessary authorisation likewise. The same obligation will be extended to services operated by small passenger vehicles. Finally, as far as the setting up of passenger transport services is concerned, the Reichsbahn will have the same rights as the Post Office has had since the decree of 1931 was passed.

In June of this year, in the case of *goods traffic*, the chief reprensentatives of the transport agencies, haulage, and motor transport industries came to an agreement with the Reichsbahn on the following points :

Short-distance traffic, which requires no authorisation, will be limited in a different way than in the past, so as to include goods carried within a radius of 50 km. (31 miles) from the place where the vehicle is regularly garaged.

Purely private transport will, as in the past, be dispensed from obtaining an authorisation for all distances. But, in the future, the use of lorries belonging to private firms for transporting other goods than their own will be prohibited.

In the case of long-distance goods transport, only those firms which can prove that they worked a given part of such traffic in 1933 will be allowed to operate in the future. New firms or vehicles will not be allowed to operate unless really needed.

All the former and new carriers allowed to operate long-distance goods traffic in the future will be grouped together into an association which will draw up an occupation *contract* on their behalf with the Reichsbahn. No firm will be allowed to work long-distance transport in the future without such a contract. In the same way, in the case of short-distance transport, all transport other than that covered by the occupation contract will be forbidden to firms newly admitted to the association. The Reichsbahn, which can in addition make use of its own motor vehicles for long and short-distance traffic, will assign to each of the firms members of the association their share of the long or short-distance traffic. The earnings of the firms will be paid by the Reichsbahn. The firms already in existence when the new regime comes into force will be compensated on the basis of a minimum annual mileage of 20 000 km. (12 400 miles).

All the consigning and accountancy services of long-distance motor transport, as well as of such short-distance transport operated by firms on behalf of the Reichsbahn, will be taken over by the Reichsbahn. Except for certain control and authorisation rights for the Minister of Transport, this administration will also decide on what routes long-distance motor services shall in future be available to the public, and fix the traffic conditions and rates.

The regular long-distance motor services of the Reichsbahn will in future

be organised in principle under the aspect of grouped consignments prepared by transport agents, and the rates will be the same as for grouped consignments by rail. Motor services will deal with most of such traffic for distances of less than 150 km. (93 miles) and with some of it for distances of 150 to 300 km. (93 to 186 miles). Other long-distance road transports, which in the main will be used to comply with the special requirements of consignors, will have their rates limited to a few classes of goods. As these rates, corresponding with the cost price of motor services, will include more or less invariable kilometric taxes, they will become higher and higher, as the distance increases, than the railway charges, which, thanks to the differential rates, decrease as the distance increases.

A noteworthy point in this scheme, on which the Government has not yet made any announcement, is that, like in the new legislation in Switzerland, Hungary, and France, special importance is attached to there being regular collaboration and, at least as far as the long-distance traffic is concerned, to the railway being protected against competition due to the financial interests of motor transport firms. In the proposed German legislation, however, the protection of railway traffic is less stressed than in the case of Switzerland. In addition, the short-distance areas in which professional motor lorry services are free to operate as they please are much greater than in other countries, and even, as far as the field of action of motor vehicles in the areas around their garages is concerned, greater than provided for by the laws now in force in Germany.

In the meantime, the need for protecting the Reichsbahn and its rating system, which is based essentially on the general economic interest of the country, against competition from private motor lorries, has once more been confirmed by the law on the *State motoring roads* passed on the 27th June 1933. This law is concerned with the construction of several thousands of miles of roads for motor traffic and also makes provision, up to a certain point, for organising the road traffic. In general these two tasks are confided to the « Reichsautobahnen » undertaking which is an affiliated company of the German Reichsbahn, and to the Reichsbahn itself. In describing the reasons for this bill, it is said in the preface that the management of the « Reichsautobahnen » must be in the hands of the Reichsbahn because competition between rail and road can only come to an end if all professional long-distance goods traffic at least is under one management.

Leaving on one side the importance of the road constructional work in the Reich for relieving unemployment, for promoting long-distance motor traffic in its various forms, and for diverting a great part of the motor traffic onto better built roads, technically speaking, particular attention must be drawn to the fact that the legislation is intended, at least to some extent, by means of traffic routes for the two methods of transport under the same owner and controlled by the same administration, to establish once more State control over transport, and over and above this, over the national economy, such as there was to a great extent before the introduction of the road motor. Obviously, this object can only be achieved to the extent that it is found possible to divert to the national motor roads the motor traffic on the other roads, and either to set up in this way unity of operation, i.e. to exclude other undertakings, or else submit the latter to regulations that will make the continuation of harmful competition impossible. The latter object could be achieved either by the imposition of a tax or some other charges, both of which could be imposed also, if need be, on such motor transport as private motor car traffic, or agricul-

tural, industrial or commercial transport, which do not come under the law relating to concessions. It must be remarked, moreover, that even when the national motor roads will have been completed, these laws on concessions will remain indispensable. They will be absolutely indispensable if the object aimed at in constructing the State motor roads is to be achieved, that is to say, centralised State control of all traffic.

The Saar Territory.

In the Saar, a decree of the 22nd February, 1933, has made it obligatory to obtain an authorisation for all passenger and goods transport carried out in omnibuses and motor lorries outside town areas on behalf of a third party. In every case, the authorisation is only given after a preliminary investigation into the need for the service. The authorities are trying to limit motor traffic to shorter-distance work.

Portugal.

In Portugal, up to 1933, it was only necessary to obtain authorisation in the case of public motor passenger transport, and only when this was carried out as a regular service. Since the 28th June, 1933, a « Decree on transport by heavy motor vehicles and their adaptation to railway transport » has extended the obligation to obtain authorisation to public transport by motor lorry carried out as regular services. Services in competition with a section of the railway are to be reserved for operation by the railway in preference.

Czechoslovakia.

According to the Czechoslovakian law passed in December, 1932, all public motor transport for both passenger and goods traffic, whether operated as regular or occasional services, must obtain an authorisation. Only agricultural, industrial, commercial, and private passenger transport, including the transport of employees and workmen by vehicles belonging to the firm employing them, are exempt from such an authorisation. The authorisation is not given if there is no need for the service or if public interests are against the service, or if the state of the roads does not allow of the transport in question. The State Railways have the right to collaborate in the procedure for delivering authorisations, and in addition have the privilege, to be taken up within a given time, of organising regular services themselves.

Occasional services can only be authorised for short distances within given areas. The Ministers charged with applying the law have agreed to the following principles in granting authorisation for transport of this kind :

Transport between large centres of production and consumption linked together by a sufficient railway system will be reserved for the railway. Traffic allowed to motor lorry services must never include two such centres in the same service. Generally speaking, the extent of the traffic areas assigned to an undertaking must be inversely proportional to the tonnage of the vehicles used. In principle, large vehicles must only be used over short distances.

According to Czechoslovakian law, fixed rates have only to be observed in the case of passenger transport. In the case of goods transport, on the contrary, there are no regulations about the rates.

Austria.

By a law which came into force on the 1st January, 1932, the system of obligatory concessions for *passenger services* was reorganised. The railways were given the right to operate for themselves, within a given time, motor services the concession of which had been asked for by some other undertaking.

In the case of *goods traffic*, new regulations were also introduced by the

law of the 9th June, 1933, governing goods transport by means of motor vehicles, whether operated as regular or occasional services, when run outside the limits of town areas.

Motor lorry transport for payment is only allowed on condition fixed minimum rates are charged. These rates are fixed by the authorities on the basis of the cost price of motor transport, and generally speaking in such a way that the short-distance transport will fall to the motor and the long-distance to the railway. According to the nature of the transport, the dividing limit of traffic is fixed at between 50 and 100 km. (31 and 62 miles).

Private transport of agricultural, industrial and commercial firms, in its turn, has been restricted in the sense that it is no longer allowable, except in a few rare cases, for distances of more than 100 km. (62 miles). In future such firms will no longer be allowed to carry out any other transport, such as carrying in their vehicles goods belonging to other consignors.

The most noteworthy feature in the Austrian regulations is the restriction of this latter sort of transport, a restriction unknown in any other country. Apart from this, no judgment can be formed about this legislation as it has been in force so short a time. The protection it will give the railways will depend essentially upon the possibility of exercising an efficient control.

Hungary.

The system of concessions was reorganised in Hungary by a law of 1930. By this law, public motor transport outside town limits is reserved, in principle, to the State itself. The State can, however, concede its operating rights in this connection to certain firms for a given time. All former concessions were cancelled as from October, 1932. New concessions can only be granted to private firms in the case of transport over a maximum distance of 30 km. (18.6 miles). Owing to insufficient control, these regulations have not given good results in practice, and consequently were completed, in 1933, by a governmental decree which handed over the right to grant concessions to the Hungarian State Railways, on the condition that they would grant concessions in agreement with the association into which all the motor transport undertakings have been grouped. The Hungarian State Railways also belong to this association, together with the motor lorry undertakings belonging to them. A committee composed of representatives of the State Railways and of the association not only grants concessions, but also directs to a large extent the way the transport services are carried out.

The country has been divided up into 7 areas in which the motor transport firms can freely carry out their services on their own behalf as well as in the service of the State Railways on certain given routes. Outside these districts, no motor transport services can be worked. Only private agricultural, industrial and commercial transports are exempt from these regulations.

According to the information supplied by the Hungarian State Railways, the new regime has proved satisfactory. From the point of view of the object aimed at and of the methods employed, it can be compared with the new Swiss regime.

Jugoslavia.

In Jugoslavia a law passed in March, 1932, makes it necessary for passenger and goods traffic worked by professional motor firms to obtain a concession. The licence, which is also required for occasional transport services, is not granted if the traffic is likely to affect firms already in existence. In addition, the granting of a concession can be made dependent upon certain conditions intended to restrict competition in the

public interest. According to the law, authorised firms have to obey more or less the same prescriptions as the railways as regards rates and the obligation to transport. The remedy in the case of goods traffic seems, however, to lie less in such regulations than in increasing the taxes on motor transport and obliging motor transport undertakings to insure their passenger and goods services. In this connection, the regime in Jugoslavia is comparable with the English method and the legislation under consideration in Belgium and Holland.

Rumania.

By a law passed in July, 1930, in Rumania as in Hungary, the State retains the monopoly of public motor services between towns. However, it can concede this right, not only to the Rumanian Railways and Post Office Administration, but to private firms, for a certain time, subject to certain royalties. According to the Rumanian State Railways, however, this law has not given good results in practice. The object in the case of goods traffic in particular — protection of the railways — has not been attained and, in consequence, it is now proposed to complete the law by other requirements. According to recent information, later efforts in this connection have led to an agreement between the Ministers concerned and the Rumanian Railways according to the terms of which, as in Hungary, the State will in the future transfer its right to grant concessions to the railways which must make use of this right according to certain given principles not yet made public. It is obviously desired to set up, in Rumania, such a regime as will achieve collaboration between the railway and private motor transport firms, as in Hungary and Switzerland, by means of the application of the regulations contained in the concessions, reserving, in principle, long-distance traffic for the railway.

Poland.

A law passed in 1932 made it obligatory for the first time in Poland to obtain authorisation for all public motor services between towns, whether regular or occasional. Only purely occasional transport, and, in the case of goods traffic, private transport is exempt from authorisation. According to the law, the authorisation should not be granted until a preliminary investigation has been made into the need for the service. This law has not yet come into force, however, except for passenger transport. Its application to goods transport has been postponed several times. According to the latest information, a further period of grace has been asked for recently, not only by the motor transport industry, but by representatives of the economic interests of the country. The economic experts favour the admission without any restriction, as in the past, of all firms who up to the present have operated motor lorry transport, while the Ministries concerned seem to want to make a selection of some of them, and in future only grant authorisations for short distances and where they will not give rise to competition with the railways.

Lithuania, Latvia, Esthonia, Finland and Norway.

In these five countries a concession for all public passenger and goods transports carried out regularly is obligatory. The laws relating to this matter have only been applied recently and only in part.

Denmark.

In Denmark likewise, goods carriers by motor lorry have not had to obtain an authorisation up to the present except in the case of regular services between given places. In the case of passenger traffic, on the contrary, a concession must be obtained not only in the case

of regular services, but also for occasional transport. The regulations on the transport of goods by motor lorry are considered insufficient. New legislation appears to be under consideration.

Sweden.

After a preliminary attempt to control competition to some extent by applying a decree of the 20th June, 1930, dealing with the maximum speed of motor vehicles and the working hours of drivers, a new decree was published in June, 1933, which not only enforced the former regulations but altered to some extent the procedure for obtaining authorisation and the conditions under which concessions are granted. At the present time, the definition of a regular service differs from the old conception; those services are now also considered as regular when the vehicles do not always travel by the same route between two places. On the other hand, in the case of goods traffic, a certain obligation to carry has now been introduced, which applies to all regular services. The activity of an authorised undertaking is generally speaking limited to a given traffic area. Transport outside this area can only be accepted if the place of departure or arrival is within the traffic area covered by the firms. When there is a question of authorising new firms, an investigation is made into the need for the new service as well as the economic value of the working under consideration.

2. Taxation of motor transport.

In most countries motor transport firms are burdened in the same way as other industrial undertakings with general duties such as property, income and business taxes, as well as in most cases turn-over taxes, i.e. according to the gross working receipts. In this latter connection, the only variation is, generally speaking, a special tax based on production, which is moreover higher than the transmission tax levied on the rest of the community.

When motor transport is taxed in any special way, such taxes are collected as:

a) a *round sum* for possessing a motor vehicle, or

b) on the *consumption of fuel or tyres,* i.e. in proportion to the use made of such commodities by the motor vehicles, but without taking into account their utility from the point of view of receipts, or

c) on the *individual firm operating the motor transport,* or finally

d) as a *royalty or transport tax* which every motor transport firm has to pay.

While the two first methods affect to an equal extent motor transport by private individuals on their own behalf, i.e. the use of small private vehicles and motor lorries belonging to private firms, and the amount charged is graded according to the use made of the vehicle, the two last methods of taxation only affect motor transport carried out for payment on behalf of a third party, and even as a rule concern none but motor transport firms properly speaking.

According to the object in view, the above mentioned methods of taxation can be divided into :

a) taxes to raise funds to cover the cost of constructing and maintaining roads, as well as the cost of policing the motor traffic, and

b) taxes imposed on motor transport like other taxes borne by the community *to increase the general financial resources of the State or towns.*

In the case of the first of these objects, there are also, in some countries, fixed tolls for using certain public roads or, where there are roads reserved exclusively for motor traffic, fixed amounts or individual taxes.

Like the Commission of Experts of the International Chamber of Commerce, the European railways are of the opinion that motor transport should, to the extent to which it is due to them, support the whole of the cost of building and keeping roads in good repair, as well as the cost of ensuring safety upon them. This is not the case at the present time in most European countries. It must nonetheless be recognised that in many countries, precisely for this object, motor transport has been increasingly taxed during the last few years. But the railways contend, in addition, that the two methods of transport should be burdened with taxes to the same extent, so that each method bears on the average the same proportion of taxation for public use. If these two principles are disregarded for the benefit of one of the two methods of transport, the unequal burden makes it impossible to divide up the traffic in a rational way from the point of view of economic working and the general economic welfare. Now, this cannot be in the real interests of the public, as this artificial diversion of the traffic, to the detriment of one method of transport and for the profit of the other, has of necessity as its final consequence an increase in the economic charges of the community; in addition it results in capital being badly invested. Inequality in favour of motor transport in recuperating the sums spent on the roads used by it and in the amount charged to the public users is still worse and can have as serious consequences as, on the other hand, the obligation to operate and especially the obligation to carry imposed on the public railway services, means a first charge on the railway reflected in a heavy expenditure. We will return to this point in the third part of this chapter.

Inclusive taxes on motor vehicles, both for general purposes or to cover the cost of making and maintaining the roads were in force, before 1930, in the following countries :

Austria	Ireland
Bulgaria	Italy
Czechoslovakia	Jugoslavia
Denmark	Latvia
Esthonia	Lithuania
Finland	Luxemburg
France	Norway
Germany	Portugal
Great Britain	Spain
Holland	Sweden
Hungary	Switzerland

In Belgium and Poland alone there are no such taxes, but only small registration fees.

A method of taxing motor transport by means of taxes or duties on the consumption of fuel or tyres was already in existence at that time in England, France, Belgium, Poland, Germany, Sweden, and Switzerland.

A special tax on each transport, in addition to the ordinary transmission tax, was only found before 1930 in Hungary and Italy for given kinds of motor transport.

Below we give the noteworthy modifications, since 1930, in the taxation on motor transport, according to the information at the disposal of the reporters, for the different European countries. To a large extent, this taxation was introduced to remedy the harmful results of competition.

Great Britain.

As from the 15th September 1932 the price of petrol was increased by 3 d. to 8 d. a gallon; this measure was followed, as from the 1st January 1934, by a further increase in the taxation on motor transport. In addition to higher taxes for motor lorry licenses, the rates for vehicles with Diesel engines were specially increased. At the same time, a new tax of 1 d. a gallon was levied on Diesel oil.

France.

In France, the taxes were generally increased after 1930. In addition, by a law passed on the 28th February, 1933, the following taxes on motor transport were imposed or once again increased :

A tax based on the total weight of vehicles in working order;

An additional fixed tax on trailers;

A tax based on the loading capacity of the motor vehicle or its trailer;

A tax on the gas oil used by motor vehicles, and finally

A tax equal to 2 % of the business turn-over of the motor transport firms.

As from the 1st February, 1934, the general taxation on motor vehicles was abolished; at the same time the tax on fuel was again increased.

Belgium.

The public motor services were taxed in 1932 according to the mileage of the service. In addition, as from the 1st October, 1933, transport by motor lorry worked in intercommunal traffic for distances of more than 20 km. (12.4 miles) on behalf of a third party was taxed to the extent of 20 % of the cost of the transport; this tax is reduced to 2.5 % in the case of transport over shorter distances. To enable these taxes to be collected, certain waybills and account sheets have been prescribed which make a control over the transport possible. However, these regulations which came into force on the 1st October 1933 had already been amended by the 31st January 1934. Since this latter date, the tax on transports has been standardised at 2.5 %.

A new additional tax introduced in 1933, on motor vehicles used for business purposes, in traffic from one district to another over a distance of more than 20 km. (12.4 miles) also came into force on the 1st January, 1934, with smaller taxes on private motor transport. At the same time the tax on motor vehicles and the additional taxes were doubled in the case of vehicles with Diesel engines. Certain tractors and trailers do not have to pay the additional tax. Omnibus services holding special concessions, ambulances, and vehicles belonging to the Belgian National Railways Company whose immunity from the tax was abolished as from the 1st October, 1933, are once more exempt from it.

Italy.

In addition to the taxation already in force, as from the 1st April, 1934, an additional annual tax on trailers was introduced, based on the tonnage.

Germany.

By a law dated the 15th April, 1930, the customs duty on petrol was increased from 6 Rm. to 10 Rm. per 100 kgr. (220 lb.). At the same time a new duty was imposed on benzol amounting to 10 Rm. per 100 kgr., as well as a compensation duty of 3.80 Rm. per 100 kgr. on native benzol and petrol. The obligation of adding a certain proportion of native alcohol to all fuel imposed at the same time also had the effect of a tax.

A general increase in motor vehicle taxation took place according to the law of the 16th March, 1931. At the same time, a special tax of 100 Rm. a year had to be paid for authorisation to use a trailer.

By a law of the 10th April, 1933, in order to encourage a revival in trade, newly purchased touring vehicles and motor cycles, with the exception of omnibuses, were entirely freed from the taxes on motor vehicles. In the case of vehicles and motor cycles already in use, a law dated the 31st March 1933 made it possible to pay a given lump sum instead of the annual tax. More or less about this time, certain facilities were also granted in paying taxes.

Czechoslovakia.

By a law passed in December, 1932, a tax of 30 % of the fare was imposed on authorised passenger transport. In the case of goods traffic, the tax is based on the tonnage of the vehicles used.

Austria.

A tax on petrol, imposed by the law of the 28th January, 1931, was increased on the 1st October of the same year. In addition, as from the 1st November, 1931, a special carriage duty (tax on motor transport) was introduced in the case of passenger and goods transport for payment.

Poland.

Although formerly motor vehicles only had to pay a small registration fee and a few local taxes and tolls, in April, 1931, in addition to a tax on fuel, they had to pay a fixed lump sum. This tax varies according to the weight of the vehicles. In addition, omnibuses have to pay a transport tax of as much as 1/3rd of the total fare. In the case of goods transport by hauliers, there is a tax based on the tonne-kilometre.

After the 1st April, 1933, the amount paid by motor vehicles was once more reduced in the case of vehicles for private use only. In addition, in the case of public passenger transport firms, this amount varies according to the number of seats and the length of the route. The fuel tax was increased at the same time.

Norway.

Since the 1st October, 1930, concession holders can be made to pay special contributions towards the cost of building new roads as well as to pay other annual taxes.

Jugoslavia.

Taxes of as much as 25 % of the transport charges were imposed by the law of the 9th March, 1932, on authorized motor transport firms, for the benefit of the road maintenance fund.

Lithuania.

The law of the 10th June, 1931, requires motor transport firms to pay certain taxes, part of which are earmarked for the Treasury and part for the road authorities.

Portugal.

The decree of the 28th June, 1933, imposed a special tax on all authorised public motor passenger and goods transport services.

Rumania.

By a law passed in July, 1930, motor services holding a concession have to pay a regular tax which varies according to the length of the line served, and the number of seats available. In addition, a tax on the working receipts has been in force from the same date.

3. Changes in the laws governing railway traffic.

The *obligation to operate and to carry* as well as the *obligation of publishing their transport rates and transport conditions,* and *of applying these uniformly to all concerned* has been imposed on the railways in all countries for many years. These special legal obligations were justified as a whole by the monopoly railways enjoyed in practice of all transport except over very short distances until the introduction of the motor. Such obligations were only necessary because of this monopoly, and to the extent to which it existed, to protect the individual user, and in the interest of the whole economic community. Likewise, only the continuation of this monopoly makes them bearable in their initial strictness for the railways. If, owing to the growing extension of other methods of transport, the monopoly and traffic of a railway is lessened,

and if at the same time, independently of railway traffic or even at its expense, the traffic worked by other methods of transport increases, then not only does the burden of its legal obligations weigh more heavily upon the railway, but State control, which is the object of such obligations, loses to the same extent its initial and only justification. Both its direct financial burdens, existing from the beginning, and its special legal obligations will be more and more against the most rational division of the traffic from the point of view of economic operation and of political economy.

We have already pointed out in the preceding paragraph that, for the various reasons given there, the public has no interest in the imposition of unequal taxes on the railway and on motor transport. The same also applies to the burden imposed on the railway by the obligations of which we are now speaking. The obligation to carry imposed on the railway is of special importance from the point of view of motor competition. It has not only the effect of increasing the cost price of rail transport above what it would be with a technical and administrative organisation unhampered by special obligations of this kind, but in addition it favours the development of competition between the motor and the railway in the sense that it makes it possible for those making use of motor services to deal with the motor undertakings when it is most to their advantage, and to leave the rest of their transport to the railway as in the past. There is no doubt whatever that a great part of the long-distance motor lorry competition, competition organised by transport agencies and carried out by motor transport firms, is only possible because the railway service, which has to carry all traffic offered, is also available.

The above considerations are probably an exact expression of the unanimous opinion of all the European railways on the special legal regulations governing their railway traffic. The Committee of Experts of the International Chamber of Commerce takes the same stand, to a large extent, in its often quoted opinion.

But if, as we have said in the opening paragraph of this chapter, the governments of most European States have for a long time been disposed to take legislative steps of a more or less radical nature to meet the new state of affairs, as regards the legal problems of the concessions to be given to motor transport and the increase in taxation on such transport, it must be remarked that, up to the present, they have done very little as far as railway regulations are concerned.

According to the information supplied to the reporters, *the obligation to carry* imposed on the railways has not been modified in any way up to the present through reformed legislation, except in Great Britain, by the 1933 Road and Rail Traffic Act, in Italy, and in France. In Italy, the law of the 21st December, 1931, has authorised the Minister of Transport to close down railway lines either partly or completely and substitute motor services for them. In France, the law of the 2nd July, 1933, introduced, in the case of secondary lines, less rigorous regulations which make it possible for the railway to cut down the number of train services on such lines. In other countries, some modification of the obligation to carry may be noticed in the sense that the State control services are more ready than they used to be to agree to the railways' demands to close down sections of secondary importance or small stations, especially when these are replaced by a public motor service.

Up to the present, the legal prescriptions relating to *the obligation to carry* have not been modified in any State by a legislative decree. At the most, there has only been a slight modification of the obligation to carry through the fact

that, in many countries, without any modification of the laws, the State control services have allowed the railways to introduce tariffs granting a given reduction in the transport rates, if the railway is used exclusively.

In the same way, up to the present, no country can point to a modification in the legal prescriptions on railway traffic in the sense that, even for the shortest distances, the railways are allowed complete *freedom in fixing their* rates. The railways have only been allowed a certain latitude within given limits and most often very narrow ones, in granting special rates, that is to say :

a) by an *alteration in the legal prescriptions* in Great Britain, where, however, such latitude was formerly in existence up to a certain point, in the Saar Territory, in France, and in Denmark;

b) by *royal decree* in Italy.

The result is that the railways of these countries can grant special rates to compete with the motor services, sometimes without special permission from the control services, and also without publishing them.

Similar laws have been considered in Holland and Belgium.

From the information obtained, the reporters were unable to discover if, during the last few years, in any country the procedure followed to obtain State approval of the rates has been better adapted to the change in circumstances due to motor transport.

In the case of the Swiss Federal Railways, the desired modification of the obligations on rates has been made in practice to a certain extent, without any change in the legal position, by reductions in rates that are not published, through the intervention of the SESA. The Italian State Railways and the Dutch Railways have been given similar opportunities through their affiliation with the INT and ATO group consignment firms. We will again deal with this collaboration between the above mentioned railways and firms in the fifth part of this chapter.

4. Steps taken by the railways to protect their traffic from motor competition.

We will begin by pointing out that this fourth part is not concerned with steps taken by the railways in respect of auxiliary services, in order to increase, for example, the efficiency and reduce the cost of cartage or, in collaboration with transport agents, to otherwise further railway traffic. Such measures are dealt with in the fifth part. In addition, we must also pass over all the steps taken to make the road motor collaborate with the railways, as such steps will be considered in detail in the 6th and last part.

In this part, consequently, we will only deal with the *steps* taken by the railways to increase their competitive capacity. These can be divided into :

a) Rating measures,

b) Measures which improve the consigning and transport services, apart from the timetables and technical traffic operation, and

c) Measures affecting the technical operation of the railways and the timetables.

On the other hand, *according to the object aimed at,* they can be divided up into :

a) Measures intended to *increase* as much as possible *the efficiency of the railway service* by making full use of all the resources at its disposal, and at the same time *reducing* as much as possible *the cost price* of railway transport, and

b) measures intended to adapt as far as possible the railway traffic and the conditions under which the railway is at the disposal of its customers *to the organisation of the service and the transport conditions of the competing motor services.*

Obviously, the rating measures taken by the railways are of special importance in connection with the motor services

used by the public precisely when they are in competition with the railway, solely or mainly on account of their lower transport charges. As we have already explained in part A of this chapter, this applies above all to motor lorry services, but also to occasional transport, of ever growing importance, carried out by omnibuses or by motor lorries adapted for passenger services.

In view of the fact that still to-day on most of the railways, it is not the whole of the passenger or goods traffic which is threatened by motor competition, but only some part of it, most of the European railways are of the opinion, as far as rating measures are concerned, that the reductions must not be made to the rates as a whole but only to the rates for those parts of the traffic suffering from competition. It is true that in this connection, likewise, the conditions vary widely from one railway to another. For this reason, many railways think it useful to make a general reduction in the rates, either in the case of the higher rated kinds of goods traffic, or in the case of goods traffic within areas of a given extent, or, in the case of passenger traffic, of 2nd and 1st-class fares.

On the other hand, most of the railways have been content up to the present, in the case of goods services, to reduce the rates for certain classes in which competition is particularly serious, or the rates granted to certain customers whose traffic, on account of its extent, is particularly valuable to the railway. In the case of passenger traffic, up to the present the reductions made in the rates affect generally speaking only the classes of passengers particularly likely to abandon the railway in favour of the motor, or else, in a few isolated cases, when there are sufficient passengers to make it worth while to offer particularly favourable prices.

On the other hand, measures in connection with the *consignment and transport services* affect goods traffic almost exclusively. In this case it has been recognised as particularly necessary to fight the motor, which is more flexible by its nature, even from the point of view of the time required for the various operations, by improving the railway services until, while safeguarding the interests of consignors, they are just as flexible or at least achieve the same object in some other way.

With this object in view many railways have simplified the formalities in force for consigning goods, and have granted, in addition, facilities for packing goods. In addition, a great many railways have changed and greatly extended the hours during which goods can be accepted, so as to forestall and meet the needs of their customers. Finally, apart from steps taken in connection with the train services, the parcels traffic has been speeded up on most railway systems by a methodical reduction of the number of transhipments.

The third group of steps taken to make railway traffic more capable of meeting competition includes, as has been stated above, on the one hand *the technical method of operating railway traffic,* and on the other, *the timetables.*

Among the measures included in the first category, mention must first of all be made of electrification, carried out on several railways, either to operate certain lines or even the greater part of the system; this has usually made it possible to speed up the train services.

This category must also include the introduction of rail motor coaches or light trains, which has been done on a great many European railways. The rail motor coaches used are of various types, dimensions, and are driven in various ways. The chief object of rail motor coach services, which are mainly used for passenger traffic, is to increase the number of stops, which is not economically possible to the same extent with steam trains. However, many railways have introduced for the same pur-

pose smaller steam trains and have found these, especially for goods traffic, better, and at the same time more economical. In the case of parcels traffic, many railways have developed these smaller train units under various forms, such as the « Leigs » (light goods trains) first introduced in Germany, which are really a kind of travelling parcels office.

As far as *improvements in the timetables and train services* are concerned, it may be noted first of all that the effects of motor competition upon passenger and goods traffic differ to some extent. In the case of goods traffic, many railways, in the last few years, have gone back, chiefly for economic reasons, on the very flexible timetables which were the general rule, to fight competition and offer a transport which is not only faster but more exactly timed. To a greater extent than was formerly the case, fixed train services which run regularly have been re-introduced in the case of goods traffic, no matter how the volume of traffic may vary. On the contrary, the timetables of passenger services, which until recently were almost exclusively of regular trains, have been more and more extended by including special trains to meet any special passenger traffic requirements that may occur. In addition, there is a growing feeling that the passenger train services should not be the same on week days as on Sundays.

But in the case of passenger traffic and goods traffic alike, all the European railways are making great efforts to *increase the running speed of the trains and to introduce special fast services* in which the average speed is increased in its turn by a reduction in the number of stops.

The various defensive steps taken by the railways in these last few years.

Rating measures applied to passenger services :

A general reduction of the rates has only been made in Spain and Norway.

A general reduction of the rates for 1st and 2nd class tickets came into force in 1928 on the German Reichsbahn.

A general reduction of the passenger rates in suburban services, or for short distances, has taken place in Belgium, Esthonia, Latvia, Lithuania, Spain, Portugal, Holland, Italy, Austria, Jugoslavia, Bulgaria, Poland and Sweden.

During the last few years, in Italy and Portugal, *workmen and office employees* have travelled to and from their work at new reduced rates.

Other *regular passengers* have been allowed new reductions by the issue of season tickets valid on the whole system or in given regions, by granting special rates if a given number of people travel together, or on other such conditions, in Great Britain, Germany, France, Italy, Lithuania, Luxemburg, in the Saar Territory, Switzerland and Hungary.

Return tickets are often issued at reduced rates in Belgium, Denmark, Great Britain, Esthonia, Portugal and Hungary.

In addition, new reduced rates have been introduced in the case of *week-end tickets* in Great Britain, France, Spain, Portugal, Belgium, the Saar, Holland, Switzerland, Italy, Germany, Austria, Hungary, Bulgaria, Lithuania, Latvia, Sweden and Norway,

and in the case of *holiday tickets* in Great Britain, France, Belgium, the Saar, Holland, Italy, Germany, Hungary, Jugoslavia, Poland, Latvia, Rumania, and Sweden,

as well as for *children's and students' tickets*, etc... in Great Britain, France, Spain, Portugal, Belgium, the Saar, Holland, Switzerland, Italy, Austria, Germany, Hungary, Jugoslavia, Poland, Latvia, Sweden and Norway.

In nearly every country people have been encouraged to *travel in groups* by further reductions in the fares. Reductions of this kind have been made in Great Britain, France, Spain, Portugal, Denmark, Belgium, the Saar, Holland, Switzerland, Italy, Germany, Austria,

Hungary, Jugoslavia, Poland, Lithuania, Sweden and Norway. The reductions granted to groups of passengers depend as a rule on the importance of these groups; but sometimes greater reductions are granted when the journey is made by given trains, special trains run for the purpose, etc...

Specially reduced *family tickets* are issued in Great Britain, France, Switzerland, Italy, Germany, Austria, Hungary, and Lithuania.

In the case of goods traffic :

According to the information we have received, a *general reduction of the rates* has only taken place in Hungary, but this was cancelled out to a great extent as the rates have been increased later on.

General reductions in rates for parcels or the higher rated classes of goods have been granted in Spain, Switzerland, Germany, Esthonia, Sweden and Norway.

General reductions in rates over certain short distances have been granted in Italy, Austria, Poland, Switzerland and Hungary. Some of these relate chiefly or exclusively to parcels, or to parcels and valuable loads.

Nearly all the railways have introduced a large number of *special rates for certain classes of goods.* These are only given as a rule in certain given services. Sometimes they depend on a certain minimum tonnage. On some railways they are granted on the condition that the customer in question sends all his consignments by rail.

Reduced rates in the form of a scale of reduced unit-rates for the tonnage loaded in one wagon, or in the form of a kilometric unit-rebate for the mileage of a wagon, no matter what kinds of goods or how much is carried in it, have been introduced on certain services in Italy, Belgium and France.

Measures in connection with the consignment and transport of goods, intended to speed up the traffic have been taken in extremely varied forms by almost every railway. Measures with this object in view, which are particularly noteworthy on account of their nature or their results, have been quoted by Great Britain, France, Belgium, the Saar, Switzerland, Italy, Germany, Austria, Hungary, Denmark, Poland and Sweden. They are mostly in connection with the speeding up of the parcels traffic. Many railways have endeavoured, without increasing the delivery times, in the case of the services and distances chiefly affected by motor competition, to transport their goods traffic so rapidly that the consignee can take delivery of goods the day after they were handed in. This result has been achieved by the measures mentioned above. The steps taken in this connection, for example in Great Britain, Germany, Switzerland, France, Belgium, Holland, Italy, Poland, Checkoslovakia, Portugal, Sweden, Hungary, Denmark and Rumania, have been successful.

The introduction of *electric traction* over new sections of line has been pointed out by the German Reichsbahn, Italy, Holland and Poland.

Measures connected with the technical operating method or the timetables.

The introduction or extension of services worked by rail motor coaches or light trains in Great Britain, France, Spain, Portugal, Belgium, the Saar, Holland, Switzerland, Italy, Germany, Austria, Hungary, Jugoslavia, Poland, Lithuania, Rumania, Latvia, Esthonia, Sweden and Norway.

A noteworthy acceleration of the steam trains and the introduction of new express services has taken place in Germany, Esthonia, France, Italy, Luxemburg, Holland, Austria, Poland, Portugal, Rumania, Switzerland and Hungary.

The *transport of groups of passengers* (clubs) *in special trains* has been more and more extended in recent years, especially in Germany.

5. Extensions of door to door services. Collaboration between the railways and haulage undertakings.

When the railways had in practice a very extensive monopoly of the goods traffic, they were sure of the traffic even when they offered their customers no other facility than the actual transport from station to station. Those concerned had to bring their goods to the departure station and collect them from the arrival station to take them to their home or business premises, without the railway risking losing their custom thereby. Nonetheless, most of the European railways organised, from the beginning, organisations of this kind, at least in the case of the parcels traffic and delivered them from the arrival station within a certain area. The general practice in most of the countries of Europe was to deliver all the parcels that arrived unless the consignor or consignee notified the railway of some other arrangement as prescribed by the transport regulations. However, formerly the determining factor in this organisation was not so much to attract traffic as the interest of the railway and the community in avoiding an accumulation of goods in the arrival stations, which would impede the smooth running of the service.

The situation only changed when the motor could compete against the railway, as a method of transport, by offering door to door transport without requiring special fixed installations, such as, for instance, private railway sidings.

Motor transport door to door services can offer their customers :

a) through transport of the goods by the same method of transport without transhipment on the way;

b) on the other hand, the consigner is able to give at the same time in *a single transport order* his instructions as to the delivery of the goods at their destination and combine the transport charges properly speaking with the local haulage rates so as to pay them himself or have them paid by the consignee.

In conection with (*a*) and the possibility of carrying goods without transhipment by the motor, an endeavour must be made to offer similar services on the railway. Among the steps taken with this object, the following may be mentioned :

1. the extension of the use of *industrial sidings connected to the railway* which will not be referred to again hereafter,

2. *transport by container,* and

3. *arrangements making it possible for wagons to run either on the railway or on the road.*

Whereas *rail-road vehicles with changeable wheels* built for the above mentioned purposes have not given good results generally, a useful solution of the problem is a road vehicle recently invented in Germany. This vehicle on which the loaded or empty wagons are carried not only makes it possible to convey them without risk over the whole of the railway system, but also simplifies technically the transition of the road vehicle from the road to the railway and inversely.

On the other hand, for the railawy to be in a position comparable to that of the motor as regards the consignor to give a through transport order, it is necessary :

1. in many European countries, first of all to modify *the regulations of the transport code,* because frequently up to the present, even in the case of parcels traffic, only the consignee can give instructions about delivering the goods on arrival; but above all that

2. *to carry out door to door collection and delivery, the railway needs a cartage service* the organisation and field of activity of which must be adapted to the new conditions.

In connection with (1), as regards modifying the regulations of the transport code, it should be noted that formerly

most consignors considered it an advantage of the railway that the cartage service could be separated from the actual transport of the goods, so that in principle the consignor himself could settle the question of haulage. However, with the extension of motoring, opinion has completely changed in this respect. Most of those concerned consider not only the transport of goods without transhipment, such as motor lorries offer, but also the facility of giving a through transport order, a great improvement to which they attach much importance without wishing, because of this, to give up as a whole, the facility offered by the railway of goods transport with transhipment of the load. In this case, the interests of the users do not absolutely require *through rates for door to door transport,* in which the transport and cartage rates are included as a single sum. Generally speaking, it is sufficient for the consignor to be legally able to include in the waybill delivery of the goods to the consignee, and the amount to be collected at the destination for cartage can in every case be calculated in advance.

In connection with (2) on the other hand, to enable the *railway cartage services* to meet competition, it is necessary :

aa) to consider *its extension to taking parcels to the departure station,* and

bb) the *incorporation of collection and delivery of complete loads,* as well as generally

cc) the *extension* of the cartage services to cover a *wider local area.*

According to circumstances, the sphere of activity of the railway's cartage services should be extended to include the districts round the arrival and departure stations.

dd) Most important of all, the *charges,* if need be, without taking into consideration the local cost of the cartage services, must be fixed in such a way that, from the consignor's point of view, they bear a definite relation to the railway rates and the value of the goods. It cannot be denied that in many European countries the cartage charges up to present time have been considered as an additional charge on railway transport, thereby making competition more serious. But the rates must also be fixed in a more uniform way, at least as far as the maximum amounts are concerned, otherwise users cannot be sufficiently certain of the amount they represent, nor calculate in advance the cost of door to door transport.

Some railways pay cartage undertakings a *subsidy* intended to enable them to keep their rates at a *low level,* or even to *lower* them in certain cases.

In most European countries, the railway cartage services have long been assured by local haulage and cartage firms. Even when, for the reasons given above, the various European railways have extended and reorganised during the last few years their cartage services, this situation is generally speaking unaltered for reasons of an economic nature, and also out of consideration for those employed up to the present in these services. However, several railways have found it necessary in this connection to obtain more extensive control over these cartage firms. In certain cases, the railways have invested capital in such undertakings, and sometimes they have even absorbed them completely. But in this latter case, once more the firms have continued to exist in the form of economically autonomous undertakings. No new local cartage services worked by the railways themselves have been set up by them during these last few years.

To control the activities of transport agents, many railways have had recourse to an auxiliary organisation of this kind, under the form of a separate undertaking, which actually belongs to them or at least is almost completely under their control. However, such undertakings only partly carry out on their own behalf the auxiliary railway services with

which transport agents are concerned. Most often their activities are limited to purely organising measures in the transport agents' usual field and to transport by motor lorry, as well as to looking for new customers.

In several countries closer control over the cartage undertakings has the sole object of obliging them to operate in a more uniform way, and above all to make them collaborate to a certain extent with the railway. But, in addition, the firms carrying out the railway's cartage services are often obliged, in a more methodical fashion than up to the present, *to look for new traffic for the railway, particularly purely rail-borne traffic*. For this purpose, their cartage contracts often impose stricter obligations upon them in connection with the preferential or exclusive use to be made of the railway.

Besides such measures dealing with the cartage services, in several countries, *closer working between the railways and the haulage firms* has been observed recently *in other activities of the latter*. In so far as this is intended to improve the position of the railways against motor competition, such measures are usually concerned with the *grouping of consignments*. In some instances this movement is limited to placing depots at their disposal at low rates, and in others they include preferential treatment in the way of dealing with wagon loads of grouped goods, in respect of consignment formalities. In addition, in many countries, the railway gives *preferential rates* or a financial subsidy to the grouped goods sent by transport agents, in order to reduce the auxiliary costs of such undertakings. Several privileges of this kind are granted at the same time on some railways. As a rule, these privileges depend on certain conditions intended to assure the greatest possible tonnage of goods to the railways, such as, for example, rates based on given minimum quantities.

The railways usually favour grouped consignments of goods sent by transport agencies, because it is recognised :

a) that goods which are suitable for grouping are particularly affected by motor competition;

b) unless such concessions are granted, an ever growing number of such agencies will go over to the motor services because of the greater intermediate profits they can obtain in this way; and

c) it is precisely motor lorry services organised by transport agencies, generally in the form of grouped transport, that forms the backbone of all long-distance competition against the railway.

Sometimes collaboration between the railway and transport agencies also makes it possible to extend the sphere of action of the railway, in the sense that :

a) as a result of closer working, *receiving and delivering offices for railway goods traffic* are set up outside the railway system in towns and places not served by the railway, or

b) the *motor cartage service organised by the railway* is worked by transport agencies and cartage contractors, or else the collection and distribution of goods is in the hands of transport agencies.

The control exercised by the railway over the activities of transport agencies and its collaboration with these latter is also intended to *give rail traffic rates the flexibility* required to meet motor competition, and this object has been achieved :

— partly by its auxiliary services, such as the cartage service, which is not subject to any scale of rates,

— and also in part, as for example in dealing with the consignors themselves in the grouping services, for the actual carriage by railway.

The cartage services of some railways have also made direct agreements with the actual consignors to reduce the railway carriage rates and terminal charges.

As conditions vary from one European

country to another, so the measures taken by the different railways to attain the objects given above differ very considerably in form and extent.

In the following paragraphs we propose to report in detail the steps the different European railways have taken in this connection during the last few years.

Great Britain.

The cartage service introduced and continued since their origin by the British railways is partly carried out by the railway itself, but mainly covered by contracting firms. Formerly it already included not only the delivery of goods to the consignees, but also the collection from the consignors. In addition, a considerable part of the cartage service in the case of complete wagon loads has always been carried out in Great Britain by the railways' own cartage services. Parallel to the growth in the British railways' motor transport services, their cartage services have grown during the last few years. Today it has in many cases been extended to a radius of 20 miles around the stations.

As far as the railway traffic of Great Britain is concerned, consignors of goods have always been able to give instructions about carting them to the place of delivery. In addition, the British railways introduced some time ago inclusive door to door rates. In view of the extension of motor competition and the development of the motor services worked by the railways, these rates have become increasingly important in recent years.

In 1933, the four main-line British railways made a joint purchase of the two haulage firms « Carter Paterson and Co. » and « Hays Wharf Cartage Company », the latter being also known as « Pickfords ». The former was an old-established firm working in and around London. Pickfords' activities, however, embraced the whole of Great Britain, and in recent years this firm had chiefly gone in for long-distance motor transport. Both firms also deal on a large scale in grouped consignments by rail. Thus by purchasing these two cartage firms and continuing to operate them as autonomous companies, the British railways not only reinforced their control over the cartage services very considerably, but at the same time took a very important share in the road and rail traffic of transport agencies.

Finally, the British railways lost no time in introducing transport by container on their systems and this method has been extended more and more during the last years. It should be noted that they have adopted many special types of containers for given kinds of goods.

France.

The French railways, on their side, have continued to extend the railway cartage services in the last few years. They have included in this service the collection of goods from consignors. In France, likewise, the door to door rates have been more and more widely introduced in latter years. In certain cases, these rates are got out in connection with transport by containers, which have been popular on the French railways for a long time.

Grouped goods traffic from transport agencies has developed on the French railways under the influence of a special rate, together with certain other exceptional rates. In the form of a refund calculated uniformly according to the actual mileage of the wagons, whether running loaded or light, rates of this kind lower the amount charged for certain services, on condition that the traffic shall be worked regularly for at least three months.

Spain.

The Spanish railways have also reported measures taken to extend door

to door transport. These relate in part to the cartage service, which has been perfected in Spain likewise, and partly to the rates. Up to a certain point, they also concern the organisation of motor services for the benefit of places some distance from the railway.

Belgium.

The Belgian railways have for a long time organised a cartage service at most of their railway stations. In large centres, such as Brussels and Antwerp, the cartage rates chargeable to consignors are reduced by rebates from the railway.

Door to door rates, at first only introduced on the Brussels to Antwerp services, have been extended during recent years to several other routes.

Consignments handed in by grouping agencies receive privileged treatment in Belgium, not only on account of the preferential transport of grouped goods wagons, but also because of the contract rates, which are similar to the exceptional French rates for grouped goods, mentioned above. The application of such rates has been extended more and more during the last few years.

Transport by containers is also increasing in Belgium.

Luxemburg.

Here again, in recent years, the railway has introduced door to door rates which to some extent are closely connected with the motor service organisations.

Holland.

The Dutch railways have long had a traffic known as « delivered to destination goods » the cartage to destination of which has always been covered by the railways. Both for this traffic and other kinds of goods, the cartage services on behalf of the railway were formerly worked in most places by Messrs. Van Gend & Loos. This firm had also set up receiving offices for the Dutch railways at many places some distance from the railway.

In 1928, the Dutch railways set up their own transport organisation the ATO (Algemeene Transport Onderneming) which completely took over the business of the Van Gend & Loos Company. By this means the railway control over the cartage service was considerably strengthened. The ATO also made a general reduction in the cartage charges. In the following years, these charges were completely suppressed in the case of parcels traffic.

With the aid of the ATO, the Dutch railways also took an increasingly active part in motor transport. In addition, the intervention of the ATO made it possible for them to organise grouping services by rail, and when motor competition made it necessary, they could carry out transport by rail or road, or at uniform rates by combined rail and road transport.

Switzerland.

In conjunction with the private firms of the country, the Swiss Federal Railways founded, in 1926, the autonomous SESA Company, one of whose principal tasks was, from the beginning, the reorganisation and extension of the cartage services, as well as the reduction and standardisation of its charges. In 1934, its cartage services were operating from 437 stations and in more than 1 100 localities. However, such cartage services are never carried out by the SESA itself, but always by local firms with whom cartage contracts have been made. Sometimes, the SESA allows cartage firms subsidies in order to enable them to keep their charges sufficiently low.

Under the name « SESA Free Door to Door Service » some years ago, free door to door collection and delivery of parcels traffic was introduced which enjoys an ever growing popularity.

Another important task has been con-

fided to the SESA with the « Organisation of motor parcels traffics » (ASTO). The nature of the motor services included in this organisation will be dealt with in the final part of this chapter. To a large extent the ASTO services are very closely connected with the extension of the cartage services of the SESA beyond local limits.

But the SESA is above all for the Federal railways and also in part for the private Swiss lines the medium by which certain consignors can be given reduced rates to combat motor competition. These reductions have to be made public.

Italy.

Similar measures to those taken by the Swiss Federal Railways have been resorted to by the Italian State Railways to fight competition from motor vehicles belonging to other undertakings. In 1929, they set up their own company, the Istituto Nazionale Trasporti (INT) whose duties are almost identical with those of the SESA. The INT is above all, too, a purely organising company which leaves the actual carrying out of the cartage services as well as motor transport and group transport to the transport agencies and local cartage firms. The whole of the cartage services of the Italian State Railways are in the hands of the INT which undertook to lower the rates, and in the case of cartage services, to introduce the same charges throughout each locality.

The INT has set up all over the country numerous agencies who maintain reception and delivery offices for railway goods traffic in all the large towns and also in places some distance from the railway. In the latter case, the management of the agencies is usually left to motor transport firms working on behalf of the INT. The concession of an agency, of a reception or delivery office, or of a motor service, is usually only made on condition that the agent or firm in question limit their activities as motor transport operators to a radius of about 20 km. (12.4 miles).

To encourage grouping, the agencies of the INT have been granted, on the lines of the State Railways, inclusive rates which have been adopted for certain services approved by the State Railways. These rates, like the French and Belgian rates quoted above, provide for a uniform kilometric rate independent of the tonnage or kind of goods. Other grouping agencies cannot profit by this reduction in the cost of transport, except through the medium of INT agents. However, this rule was abolished in 1932, and replaced by an exceptional rate which the other transport agencies can now claim directly for grouped consignments.

With the aid of the INT, the Italian State Railways also introduced, as from 1931, a door to door service, originally for express parcels traffic. The organisation of new door to door services has taken place in parallel with the progressive extension of the INT motor services.

A special company was formed in Italy for the construction and operation of containers, the SICON, in which the Italian State Railways hold most of the shares. Transport by containers, which is also a door to door service, comes under special conditions and rates.

Finally, the INT is also made use of, like the SESA in the case of the Swiss Federal Railways, by the Italian State Railways lines in competition with road motor transport, for the granting of rates reductions which are not made public.

Germany.

In Germany also, in the post-war period, the cost of the accessory operations in connection with consignment and cartage proved to be more and more an intolerable preliminary charge on the railways, owing to motor competition.

For this reason, in 1931, the Reichsbahn entered into an agreement with the greatest cartage firm in the country, Messrs. Schenker & Co., according to which the latter would set up a new company to be called the Deutsche Bahnspedition. This Company was entrusted, on behalf of the Reichsbahn, with all tasks in connection with cartage, consignment grouping and canvassing for new customers.

With the help of the Deutsche Bahnspedition, the railway cartage services throughout the Reichsbahn were completely reorganised. The cartage services were everywhere made to include collection of parcels, as well as cartage to the station and delivery of complete wagon loads of valuable goods. At the same time, uniform maximum rates were introduced over the whole country, and subsidies intended to make it possible to keep the rates sufficiently low were paid to railway cartage firms whose cartage costs were higher than their receipts. Subsidies of an equal amount also had to be granted, for their cartage operations carried out in connection with the same consignments, to all transport agencies and cartage firms who helped to carry out, before 1932, the cartage services of the station concerned, with given minimum tonnages.

If necessary, in competing against the motor, the Reichsbahn, through the Deutsche Bahnspedition, also pays larger subsidies to firms carrying out the railway's cartage services or to other transport agents, and sometimes even to the actual consignors, in order to make the cost of collection and delivery, and if need be the other expenses incurred, lower than the official rates, which have already been generally reduced. Usually such subsidies are granted on condition that the consignors or agents helped in this way make use of the railway facilities offered by the Reichsbahn, either exclusively or to a given extent.

In recent years, this measure has been applied more and more, particularly to the benefit of the agents in carrying out the transport of their grouped consignments. An exceptional rate, in the meantime abolished, used to be given to such transport before the agreement with the Bahnspedition came into force. To augment the competitive capacity of these grouping agencies and improve at the same time the position of the Reichsbahn itself in fighting motor transport, the grouping services of these agencies under the direction of the Deutsche Bahnspedition has been organised more strictly and further extended within the limits of the above mentioned agreement. Today there are about 3 500 agencies and cartage firms taking part in the official cartage services reorganised by the agreement with the Bahnpedition, and in addition to many of these firms, there are about 400 firms affiliated with the Deutsche Bahnspedition to deal with the reorganised group consignment traffic. At the present time this traffic, with more than 1 100 regular services, covers more than 90 % of the total grouping traffic in Germany.

To carry out this project in spite of the strong opposition to be expected from the transport agencies, the Reichsbahn first of all considered it absolutely necessary to link up the Deutsche Bahnspedition very closely with some real consignment agency capable of making a great effort. After the essential reorganisation work had been successfully completed in the first 18 months, it was prepared in principle to relax this connection. The Deutsche Bahnspedition, Ltd., was separated, in 1933, from the Schenker Company and became the sole property of the Reichsbahn. Meanwhile, in 1934, new negociations were entered into with representatives of the German consigning and cartage industry and ended, in June of this year, with a new agreement also covering motor transport.

By this agreement, the reorganisation

of the cartage services and grouped consignments traffic as defined in the contract with the Bahnspedition must continue, but at the same time self-contained transport agencies can come into it to a greater extent than previously. Under the hypothesis that transport by motor lorry will be regulated at the same time, according to the spirit of the new bill of law on concessions, (proposals considered above in paragraph 1 of part B), the present subsidies, either to keep the rates on a low level, or to lower the cartage and other auxiliary charges, it is hoped, will be abolished. In the case of grouped traffic, such subsidies will be replaced by an exceptional rate which will also be applicable to the traffic of transport agencies, and in the future to motor transport, in agreement with the Reichsbahn.

Side by side with the above measures, the Reichsbahn, during the last few years, has extended the use of containers. Apart from the small containers which now number about 10 000, large containers have also been put into service during the last 18 months. The technical construction of containers as well as the conditions under which they are at the disposal of customers have been more and more improved.

This also applies to the road vehicle, mentioned in the first paragraph of the 5th part, for transporting wagons between the stations and the points of delivery when there is no connection by rail. Vehicles of this kind are already in regular use at several places for carrying the goods traffic of certain consignors. They are also kept in reserve at some of the large centres for use in case of need.

The Saar Territory.

During the last few years, the railways of the Saar have also introduced rates for door to door parcels traffic, which have been progressively applied to all the stations on the system. In the case of certain services to French stations, and, in particular, Alsace-Lorraine, exceptionnally reduced rates are granted for grouped consignments.

Portugal.

The Portuguese railways mention the setting up of receiving offices away from the railway, in collaboration with motor transport firms.

Czechoslovakia.

In order to make their haulage services less costly and better attract traffic to the railway, the Czechoslovakian State Railways first of all considered setting up collecting offices and extending their cartage services. This has been done for some years in several of the large towns.

In view of the opposition to these measures from transport agencies, negociations were entered into between them and the Czechoslovakian State Railways, which led to the regime now in force :

A new association, known as the SPEDRA was founded, consisting of the transport agents whose part it was to organise the cartage services and grouped consignments traffic in such a way as to reduce long-distance motor transport as much as possible.

The regulations adopted in Czechoslovakia are in fact very similar to those to be applied in the future in Germany, with some slight modification of the stipulations in the contract with the Bahnspedition. In Czechoslovakia, too, grouped consignments traffic handed over by transport agencies is granted an exceptionally favourable rate. Reductions in the rates granted as rebates are not given directly to the agents affiliated to the SPEDRA, but to the latter, which divides them up amongst them. Out of these sums, the SPEDRA also has first of all to subsidise the transport agencies and cartage firms carrying out the cartage work in order to make up the difference between the reduced rates

generally applicable or laid down for particular cases by the Czechoslovakian State Railways and the cost of the service in question. According to the new regulations, in Czechoslovakia, as in Germany, grouped traffic handed over by transport agencies has been reorganised in such a way that, in principle, in the same service there is now only a single grouping service.

Austria.

For a long time, the Austrian Federal Railways have worked the cartage services in Vienna themselves, while in other places they have entrusted such services to transport agencies or cartage firms of local standing.

A door to door service introduced in recent years in the case of parcels traffic was again abolished in 1933. This was due to the growing extension of the motor services operated by the Austrian Federal Railways; we will return to this subject in part 6.

In Austria, too, consignments grouping is encouraged by reduced rates, though there is not always the same methodical collaboration between the Federal Railways and the transport agencies, or between the various agencies themselves, as in Germany or Czechoslovakia.

Hungary.

Just as private road motor services extended, the motor cartage services operated by the administration also grew on the Hungarian State Railways. The cartage services are worked in part by the railway itself, but in most cases by cartage firms in agreement with the railway.

Grouped traffic receives no preferential treatment.

Rumania.

Since 1933, reduced rates have been introduced for the grouped consignments traffic worked by the Rumanian Railways in collaboration with transport agencies who have entered into an agreement with them.

Poland.

In Poland, likewise, the railway cartage services have been greatly extended during the last few years. At the same time, central goods receiving offices have been set up in many places, even at some distance from the railway.

Since 1933, grouped consignments handed over by transport agencies are encouraged by exceptional rates which grant them, if certain conditions are complied with, rebates of as much as 25 %.

In *other countries* again, such as Latvia and Esthonia, it is reported that the railway cartage services are being extended and, in particular, are now run outside local limits.

6. Active participation of European railways in motor transport.

We have already shown in chapter II, part A, that in the railway and road motor problem a compromise has to be made between two different technical methods, and also between public and private transport. The considerations developed below are intended to show in both cases the solution adopted by most European railways which take an active participation in the motor services.

In principle, we must maintain that all traffic which, whilst meeting the requirements of the users, can be handled as well as or even better, and, as far as the cost price is concerned, more economically, by rail than by motor, should be reserved in the future to rail. This is an indispensable condition, if only to cut down as far as possible the total public expenditure upon transport. It would be a mistake to want to limit, even in the far future, the part the railway plays in carrying raw materials in bulk. Isolated passengers and smaller quantities of goods can, generally speaking, be carried more cheaply by rail than by motor, both as regards operating costs and also in the interests of the

users, when they can be grouped with other passengers or consignments being carried at the same time and under the same conditions over the same route. For this reason namely, the general handing over of parcels traffic to motor transport would be unjustifiable in practice. It would also be a mistake to think that, in the case of short-distance transport, the motor has the advantage over the railway in every case, simply because the distance is small. On the contrary, any superiority is frequently due solely to the cost of collecting and delivering in districts not directly served by rail being too high in proportion to the total cost of short-distance transport. In other cases, the superiority of the motor over the railway in the case of short distances may be due to its greater independence, as regards time, in carrying out the transport. Under certain circumstances, this point of view may also justify the motor taking away long-distance traffic, on condition that, in the case in question, flexibility in working the transport is the more important requirement. We know by experience that, in the case of goods traffic, this condition is found relatively often in connection with perishable goods, and also, within certain limits of distance, with grouped consignments traffic offered by transport agencies. Finally, the geographical nature of the country and the relative location of the railway system and the roads may result, even for long-distance transport, in the motor shortening the journey sufficiently to give it the advantage both from the point of view of the firm operating it and its customers.

Apart from the exceptions resulting from the above considerations, the public long-distance services should, in principle, continue to be carried out by rail, while public transport over small distances should be reserved for the motor to a certain extent, particularly when the traffic is small.

However, when dividing up the traffic between the two methods of transport, purely economical reasons alone cannot be decisive. The development in the use of *private* motor vehicles must also be considered because of the effect of such vehicles on *public* transport.

Experience shows that motor vehicles belonging to private individuals are endeavouring to get hold of the traffic to an increasing extent, if only to obtain their better utilisation economically. Even when the motor is mainly bought and employed to cover transport from outside the field of action of the railway, some loss of custom for the railway may result. It is known by experience that, even in the case of definite collection and delivery services, the private motor does not as a rule link up with the railway at any other than the nearest departure and arrival stations, nor beyond the points best situated for carrying out public transport in the most rational and economic manner. Were the railways to offer no resistance to the development of transport by private motor vehicles, they would necessarily lose much more traffic than is inevitable even now. In many cases, too, they would assist in de-classing in a most uneconomic way the traffic left to them. This is why the traffic must often be transferred systematically from the railway to the motor, a transference which lies momentarily outside the effects of private motor competition, and is justified by economic operating reasons, as well as, in particular, for protecting the public traffic more effectively.

The expansion of motor transport also makes it necessary, for these reasons, to *fix the limits separating public and private transport otherwise than in the past.* We have already pointed out in the 5th part of this chapter that formerly, while the railway had in fact a complete and extensive monopoly, public transport had to be content with working traffic between stations linked

together by the railway. This is no longer the case to-day, unless we are prepared to see, through the growing loss of traffic, the efficiency and consequently the importance of the public services becoming less and less day by day. The most effective legislation on concessions cannot prevent private transport making use of motor vehicles from constantly increasing, even over long distances. If the railways, under these changing circumstances, wish to keep, for themselves and the public service, the position they have held up to the present in the transport industry, they cannot rest content with improving their rail traffic and local cartage services by the measures described above, nor with increasing their competitive capacity by collaborating with the transport agencies. They must on the contrary increase their efficiency by using motor vehicles themselves. Naturally, the decisive factors vary greatly from one country to another and even from one railway to another. The greater the railway system, the more likely is it to increase its traffic in an economically advantageous way by so extending its public services.

In pursuing these objects, the railway must not be satisfied with retaining in the future the same volume of traffic as up to the present. Nor, in particular, when dividing up the traffic, must the conservation of the capital invested in railway equipment be regarded as the most important consideration. Before the road motor vehicle appeared, the railway undoubtedly carried much traffic which to-day can be better handled by motor, if not always more cheaply.

According to the information collected from most of the European railways, in few cases is there any financial benefit in transferring to the motor services traffic so far worked by rail, i. e. is there obtained any reduction in the cost of transport. On the contrary, motor services generally cost more, certainly for the actual journey, and sometimes also for the accessory services, than comparable railway transport. The benefit the railways can obtain from using motor vehicles must be sought as a rule in the extension of their field of action, and consequently in the increase of their traffic they are in possession of, as well as in a more efficient protection of such traffic.

Finally it may be asked how can railway motor services best be operated, i. e. is it best for the railway to run the motor services itself with its own vehicles and staff, or to entrust it to a contractor ? There is great divergency of opinion on this subject.

As far as railway-operated motor services are concerned, one of the points usually bought forward in their favour is that this is the only way to reconcile definitely the opposed nature of the two methods of transport, and achieve a rational collaboration between them. It is also pointed out that when the railways operate their own services they find it easier than when co-operating with other contracting firms, to work the traffic, according to the case and conditions, by rail or by motor as preferred. Finally, it is pointed out that when they operate the services themselves, the railways can use their staff more economically, besides making it easier to employ redundant staff from other railway departments.

On the other hand, operating through contracting firms has the advantage that the motor services are to some extent less easily controlled than the railway operated services, so that motor services assured by contractors financially responsible are as a rule less costly than railway-operated motor services. Another factor in favour of services operated by contractors is that the driving staff have much less rigidly defined working hours. The chief reason why contractors have been given a relatively large part of the motor services belong-

ing to the European railways is doubtless the tactical position in which the railways have found themselves through former competition from private motor transport firms. By binding the firms to their service, the railways wished at the same time to make their activities less harmful to the railway.

We are now going to show in detail how the active participation of the railway in motor transport has developed during the last few years in the different European countries. It should also be noted that many railways have only recently, as a result of special action on the part of the authorities, or by legislation, been given the right to operate motor services themselves or else been allowed to concern themselves in motor transport through the medium of contractors.

Great Britain.

The British railways were only allowed to extend their activities to the road in 1928, except for certain local cartage services. Formerly even purely financial participation in motor transport was forbidden them.

Since then, however, the British railways have played a preponderant part in omnibus traffic from one district to another, either by purchasing shares in motor transport companies or by making agreements with them for various services. These omnibus services are being used more and more to improve the service when there is very little traffic. Motor vehicles belonging to the railway are also used, but not many, for such passenger services. Thanks to the introduction of combined rail and bus tickets, connecting services of this sort have been more and more improved.

In the case of goods traffic, the British railways own large numbers of motor lorries which generally speaking are only used in the local cartage services and for collecting and delivering goods round the railway stations. Vehicles belonging to motor transport firms are used for the same purpose in the service of the British railways. By making use of lorries belonging to the railway and to contractors, the transport of parcels up to the present carried by rail has sometimes been diverted to the road in cases where there is not much traffic. By means of the two large cartage firms purchased in 1933, the British railways have now some interest in long-distance motor lorry traffic.

Motor services set up and subsidised by the British railways are often closely identified with container traffic, to which these railways have devoted particular attention.

Ireland.

In conjunction with the Dublin Tramways, the Irish Railways have secured, for some years, an actual and wide monopoly in the case of bus services.

On the other hand, they are taking an increasingly large part in transport by motor lorry, and assuring this traffic more and more by their own motor services. The regulations mentioned in the 1st paragraph of this chapter also cover, as explained, the extension of the motor lorry services belonging to the Irish railways.

France.

The French railways, at an early date, took an interest in bus services from one district to another, by making operating contracts; they also participated financially in bus services. Up to the present, they have not introduced bus services operated by themselves. In carrying out their schemes according to the new legislation, which came into force at the beginning of this year, they have attached particular importance to collaborating with private firms rather than introducing railway bus services.

This also applies to the goods traffic. A few railway-operated services had,

however, been organised in previous years.

The active participation of the French railways in passenger as well as goods motor transport is actually limited as a rule to short-distance traffic. In addition, in the case of bus services, excursions to picturesque parts of the country are an important feature.

Spain.

According to the information we have received, the Spanish railways have taken little part in motor transport up to the present. All they have actually done, in the case of goods traffic, has been to arrange supplementary services by contracting firms on behalf of the railway.

Belgium.

Unlike the Spanish railways, the Belgian railways, which were not allowed to take part in motor transport until 1932, apart from local cartage services only concern themselves with passenger transport. They have set up a certain number of services which they partly work with their own buses, but mainly with the help of private contractors. Generally only well-defined short-distance traffic is handled.

Holland.

The Netherlands Railways are only interested in motor transport through the intermediary of their subsidiary organisation, the ATO. The ATO also works, on a relatively small scale, regular passenger services. On the other hand its participation in motor lorry traffic is on a more extensive scale. The ATO's motor lorry transport is not limited to collecting and delivering on behalf of the Netherlands Railways but also includes exclusive motor transport often over long distances.

Switzerland.

Owing to the fact that the Confederation's monopoly for bus services from one part to another is reserved in principle to the Post Office Administration, the Federal Railways take no part in passenger motor transport. In the same way, the participation of private Swiss firms in this traffic, which requires a special concession, is relatively small.

On the other hand, the active participation of the Federal Railways in motor goods transport, as far as the ASTO traffic worked by the SESA is concerned, has constantly increased during recent years. The object of this motor organisation, which has been in existence since 1930, is on the one hand to extend on a large scale the public services offered by the Swiss Federal Railways to the greater part of the social and industrial centres of the country that lie at some distance from the railway, and on the other hand to transfer to a large extent the parcels traffic handled by rail to motor services. In the place of the 641 goods services, still in existence, also dealing with parcels traffic on the railway, a re-organisation is being gradually introduced by which parcels traffic will only be conveyed by rail between 84 centres. In all other places, even where the parcels have been sent direct by rail up to the present, this traffic will in the future be handled entirely by motor services.

This programme is the chief task to be completed before taking in hand the collaboration provided for in the new legislation between the Swiss Federal Railways and the motor transport undertakings holding N concessions, which in future are to be included in the reorganised SESA. Consequently, likewise, the future active participation of the Swiss Federal Railways in motor transport will apply to distances of not more than 30 km. (18 miles), in addition to their collaboration with other transport firms.

Italy.

Participation of the Italian State Rail-

ways in motor transport is limited, in actual fact, to goods traffic and mainly in this latter connection to collaboration between the INT and its affiliated motor transport undertakings. Under this aspect, the zone of short-distance motor goods services organised by the Italian State Railways have been constantly extended during recent years, in conjunction with an increase in cartage and door to door services.

On the other hand, some of the private Italian railway companies have introduced bus services to replace former train services.

Germany.

The Deutsche Reichsbahn takes no share in passenger motor transport except in the case of a few services actually belonging to it. However, according to an agreement entered into in 1929 with the German Post Office Administration, the Reichsbahn has been given control over the Post Office motor services and an economic participation in new services and services over special routes operated by the German Post Office Administration. Up to the present, the motor bus services of the two State transport administrations are short-distance services or especially better services between places at some distance from the railway. An enquiry is being held at the present time to see if, and to what extent, this agreement should be modified or extended, particularly in view of the law on the new State fast motoring roads.

The participation of the Reichsbahn in motor goods transport has been considerably increased during the last 18 months. The number of motor lorries belonging to the railway and the vehicles owned by firms working on behalf of the Reichsbahn has greatly increased. Uu to the present, the Reichsbahn's motor goods traffic is chiefly limited to parcels traffic worked parallel to the railway or to collection and delivery services. Many of the parcels services have been greatly speeded up owing to the use of motor vehicles. However, according to the new regulations described in the 1st part of this chapter, the object — the organisation of long-distance motor transport, door to door services, delivery of complete loads, and, in particular, the extension of the collection and delivery services — has also been considered.

Saar Territory.

The participation of the Saar railways in motor transport is limited at the present time to contracts with firms to carry out goods transport by short-distance motor services. Agreements of this sort have been made mainly as a consequence of the extension of the cartage services.

Portugal.

The Portuguese Railways have signed contracts with motor transport firms in the case of both passenger and goods traffic. The Portuguese railways' motor goods services, worked in this fashion, have grown considerably. They include more especially the short-distance parcels traffic, and services in localities some distance from the railway.

Czechoslovakia.

In Czechoslovakia, the official bus services from one part to another used to be worked to a great extent by the Post Office Administration. The participation of the Czechoslovakian State Railways in bus services had long been limited to a relatively small number of services. In 1933, the position was changed : all bus services worked by the Post Office Administration were then transferred to the Czechoslovakian State Railways.

During the last few years, they have also played a more active part in working motor goods services. In Czechoslovakia, unlike in most other countries,

everything seems to be tending to a more and more extensive traffic worked by motor lorries belonging to the railway. Up to the present, the programme is limited exclusively to short distances, and mainly to the parcels traffic. As on most other railways, an endeavour is being made, while organising motor services, to increase at the same time the field of action of the railways and to speed up the parcels traffic. In this country, it is proposed to close down small stations for all the services, or at least for the parcels traffic, wherever the extension of the motor services makes this possible.

Austria.

The Austrian Federal Railways, in recent years, have taken an ever increasing part in motor transport in the case of passenger traffic and also goods traffic. In 1933, the different firms by means of which the Federal Railways and the Austrian Post Office Administration operated, or caused to be operated on their behalf, motor transport, were grouped into a single association, the « Kraftwagenbetrieb der Österreichischen Bundesbahnen » (KÖB) (Austrian Federal Railways' motor services). Legally the KÖB is an independent company, but in fact it is completely under the control of the Austrian Federal Railways. The KÖB operates many passenger services and goods transport, either regularly or occasionally. In the case of goods services, the KÖB is entrusted in particular with assuring door to door transport of the parcels traffic, and also of complete loads. The Austrian Federal Railways' cartage service in Vienna, which used to be worked separately, has also been affiliated to the KÖB.

In addition to the above mentioned participation of the Austrian Federal Railways in motor transport, contracts made with private motor transport firms covering both passenger and goods services, remain in force as in the past.

Hungary.

The Hungarian State Railways for some years have participated in motor passenger and goods services through their MAVART company. The passenger services are mainly intended to offer better services to places some distance from the railway and also, on many lines, to increase the frequency of the departures provided for in the timetables. On the other hand, goods services are organised, either as door to door services in respect of places some distance from the railway, or parallel to the railway lines with small traffic. In this case, they generally only work the parcels traffic, from one goods depot to another. The increased control which the Hungarian State Railways have been given since 1933 through the reorganisation of the concession system over motor lorry traffic has already been described in the 1st part of this chapter.

Poland.

The motor passenger and goods transport services which the Polish Railways have set up have so far been relatively few in number. They are operated either directly by the railway or by contracting firms.

Denmark.

The participation of the Danish State Railways in motor transport has become of growing importance during recent years. In the case of passenger traffic, the Danish State Railways have progressively got nearer and nearer to achieving a real and wide transport monopoly by organising their own services and recovering traffic formerly worked by private firms. In the case of goods traffic, likewise, a considerable increase has been noticed in recent years in the number of motor services belonging to the Danish State Railways. The object of these measures is to divert the passenger traffic and the parcels traffic from the railway to the motor services where

there is little traffic, at the same time improving the service offered to places at a distance from the railway.

Complete wagon loads are still dealt with by the railway.

Sweden.

While private Swedish companies operate their own road motor services on an extensive scale, the participation of the Swedish State Railways in motor transport has been limited, up to the present, to working several passenger and goods services owned by them, and to agreements made with firms, relating sometimes to passenger, and sometimes to goods, traffic. The private Swedish companies have replaced many of their former railway services by motor services introduced by them.

Norway.

The Norwegian Railways, likewise, have retained some control over the passenger and goods services worked by motor transport firms in their own hands, by making agreements with them.

ERRATUM.

BULLETIN, November 1934.

Transition curves, by P. H. JACKSON.

Page 1216, second column, fifth line from the bottom :

Instead of : « speed limit » line in figure 1 has the... ...

Read : « speed limit » line giving the lower.....

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

JULY (1934)

016. 385. (02]

I. — BOOKS.

In French.

1934 385 (.44)

ODFERNAUX (R.).

Les Grands Réseaux de chemins de fer français. nnée 1933.

Paris (6e), Librairie Dunod, 92, rue Bonaparte. manuel de poche (12 × 18). 40 pages. (Prix : francs français.)

1934 665 .882

ETTE (M.).

Manuel de soudure autogène.

Paris, J. B. Baillière et Fils. 1 volume, 429 pages 226 figures. (Prix : 28 francs français.)

1934 624 .5

OUMANSKI.

Les efforts de suspension dans les ponts suspendus inis de poutres de rigidité.

Paris (6e), Librairie Ch. Béranger, 15, rue des Saints-res et Liége, 1, quai de la Grande-Bretagne. 1 volu- (16 × 25), 20 pages et 2 diagrammes. (Prix : francs français.)

1934 625 .13 (.493)

AN HAUWAERT (P.).

Les tunnels sous l'Escaut à Anvers.

Liége, La Technique des Travaux, 196, rue Grétry. volume (22 × 27.5), 112 pages, 104 figures et 1 plan-e hors texte. (Prix : 20 francs belges.)

In German.

1934 721 .9

EICH (F.).

Stahlhochbauten, ihre Theorie, Berechnung und bau-he Gestaltung.

Berlin, Julius Springer. 1 Band, 376 Seiten, 509 bildungen. (Preis : 46.50 R.M.)

1934 691 & 721 .9

EMPERGER (F.).

Handbuch für Eisenbetonbau.

Berlin, Whilhelm Ernst & Sohn. 1 Band, 481 Seiten und 560 Abbildungen. (Preis : 5.50 R.M.)

1934 691 & 62. (01

GRAF (O.) und BRENNER (E.).

Versuche zur Ermittlung der Widerstandsfähigkeit von Beton gegen oftmals wiederholte Druckbelastung.

Leipzig, Johann Ambrosius Barth und Brüssel, Falk, Fils, 22, rue des Paroissiens. 1 Band, 26 Seiten und 16 Abbildungen. (Preis : 3.90 R.M.)

1934 624 .2

KLEINLOGEL (A.).

Der durchlaufende Träger.

Leipzig, Johann Ambrosius Barth und Brüssel, Falk, Fils, 22, rue des Paroissiens. 1 Band, 192 Seiten, 105 Abbildungen. (Preis : 18.50 R.M.)

1934 621 .116

SPALCKHAVER (R.) und RÜSTER (A.).

Die Dampfkessel nebst ihren Zubehörteilen und Hilfseinrichtungen (Ergänzungsband).

Berlin, Julius Springer. 1 Band, 190 Seiten, 338 Abbildungen und 2 Tafeln. (Preis : 32 R.M.)

1934 62. (01

von SCHWARZ (M.).

Röntgenschattenbilder von metallischen Werkstücken und ihre densographische Auswertung.

München & Leipzig, Fritz und Joseph Voglrieder. 1 Band, 35 Seiten und 23 Abbildungen. (Preis : 3 R.M.)

In English.

1934 38 & 65

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.

The ultimate consumer. A study in economic illiteracy. A consideration of consumers as a special interest group, with particular reference to standards,

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, o. 1509).

prices, and the actual and potential means of consumer protection.

Philadelphia, Pa. Published by the Association, 3457, Walnut Street. 224 pages.

1934 **656 .25 (06 (.73)**

AMERICAN RAILWAY ASSOCIATION. Signal Section.

Minutes, fortieth **Annual Meeting,** Chicago, Ill., March 12-13, 1934.

New York, Published by the Association, 30, Vesey Street.

1934 **656 .211.7 (.42)**

BURTT (Frank).

Cross-Channel and coastal **paddle steamers.**

London S. E. 1. Richard Tilling, 104, Great Dover Street. (8 1/2 × 5 1/2 × 1 1/2 inches), 440 pages, illus. (Price : 15 sh. net.)

1934 **385 .1 (.73)**

CHAPMAN (J. W.).

Railroad Mergers.

New York. (Simmons-Boardman) Publishing Co., 30, Church Street. (9 × 6 inches), 157 pages, illustrated. (Price : $ 3.00.)

1934 **69**

CRESKOFF (Jacob J.).

Dynamics of earthquake-resistant structures.

New York and London. McGraw-Hill Book Co. (6 × 9 inches), 127 pages, tables and diagrams. (Price : $ 2.50.)

1934 **621 .135.4 & 625 .215**

DENDY MARSHALL (C. F.), M. A.

The motion of **railway vehicles** on a curved line.

London, S. W. 1. The Railway Engineer, 33, Tothill Street, Westminster. (Price : 12 sh. net.)

1934 **385 (09 (.73)**

HENRY (Robert Selph).

Trains.

Indianapolis, Ind. (V. S. A.). Published by Bobbs-Merrill Co. (9 × 12 inches), 110 pages. (Price : $ 2.50.)

1934 **016 .621. (06 (.42)**

INSTITUTION OF MECHANICAL ENGINEERS.

General index to proceedings, 1921-1930.

London, S. W. 1. Published by the Institution. Storey's Gate, St-James's Park. 373 pages.

1934 **656 .1 (.73)**

JACOBUS (F. Leslie).

The **motor truck** red book and directory.

New York. Publishing by the Traffic Publishing Company, Inc. (10 3/4 × 8 inches), 725 pages. (Price : $ 10.00.)

1934 **385. (08 (.73**

KANSAS CITY SOUTHERN RAILWAY Co.

Thiry-fourth **annual report** for the fiscal year ende December 31, 1933.

Kansas City, Mo. (U. S. A.). Published by th Kansas City Southern Railway Co. 40 pages an tables.

1934 **621 .4**

MALEEV (V. L.).

Internal-combustion engines. Theory and design.

London. McGraw-Hill Publishing Co. Ltd. (Price 24 sh. net.)

1934 **62. (01 & 69**

STROYER (R.), M. Inst. C. E.

Concrete structures in marine work.

London. Knapp, Drewett & Sons, Ltd. (Price 15 sh. net.)

1934 **656 .2**

WALTHERS (W. K.).

Signal and control manual for miniature railway

Milwaukee, Wisc. (U. S. A.). Published by W. H Walthers, 1414 W. Walker Street. (6 × 8 inches, loose leaf, flexible leather binding). (Price : $ 5.00.)

1934 **529. (0**

WORLD CALENDAR ASSOCIATION.

Journal of Calendar Reform. Vol. III, 1933.

New York. Published by the Association, 485, Madison Square, 160 pages.

In Spanish.

1934 **621 .133.**

El problema del carbón en los ferrocarriles.

Madrid, Asociación General de Transportes por Vía Férrea. 1 volumen, 56 páginas.

In Italian.

1934 **691 & 721**

SANTABELLA (L.).

Il cemento armato. Le applicazioni nelle costruzioni civili ed industriali.

Milano, Ulrico Hoepli. 1 volume (17 × 24), 526 pagine et 450 figure. (Prezzo : 52 lire.)

In Portuguese.

1934 **313 .385 (.81**

Estatistica das Estradas de Ferro do Brasil relativ das annas 1931 e 1932.

Rio de Janeiro, Inspection fédérale des Communications Praça Maná, 10. 1 vol. (18.5 × 27), 239 p.

016. 385. (05]

II. — PERIODICALS.

In French.

Annales des Mines. (Paris.)

.934 313 : 621 .118 (.44)
nales des Mines, décembre, p. 450.
ıccidents d'appareils à vapeur survenus pendant ınée 1931. (3 000 mots.)

Arts et Métiers. (Paris.)

1934 669
:s et Métiers, avril, p. 69.
IARCOTTE (E.). — Les derniers progrès métallur-ues. (4 500 mots & fig.)

1934 691
:s et Métiers, avril, p. 74.
LABIESSE (L.). — La lutte contre la corrosion. 200 mots.)

1934 621 .132.8
:s et Métiers, avril, p. 84.
IANRIOT (M.). — La locomotive à vapeur arti-ée aux colonies. (4 400 mots & fig.)

Bulletin de la Société d'encouragement pour l'industrie nationale. (Paris.)

1934 621 .132.5 (.73) & 621 .134.3 (.73)
l. de la Soc. d'encouragement pour l'ind. nation., mars, p. 173.
VARDE (P.). — La locomotive à haute pression F. Loree, du Delaware and Hudson Railroad. (4 000 ts & fig.)

Bulletin de la Société des ingénieurs civils de France. (Paris.)

934 625 .143 & 625 .212
l. de la Soc. des ing. civ. de France, novembre-décembre, p. 1159.
ACQUEYRISSE. — Le rail et la roue. (19 000 mots ig.)

934 656 .1 & 656 .2
l. de la Soc. des ing. civ. de France, novembre-décembre, p. 1229.
IARIAGE (A.). — Le rail et la route. (11 000 mots ig.)

Bulletin technique de la Suisse romande. (Vevey.)

1934 621 .392
Bull. tech. de la Suisse romande, n° 10, 12 mai, p. 113.
ROSENTHAL (D.). — Nos connaissances actuelles sur l'état des tensions dans les cordons de soudure. (1 100 mots & fig.)

Chronique des transports. (Paris.)

1934 385 .113 (.73)
Chronique des transports, n° 8, 25 avril, p. 5.
Les chemins de fer des Etats-Unis en 1933. (3 500 mots.)

1934 385 .5 (.44) & 656 (.44)
Chronique des transports, n° 9, 10 mai, p. 3.
Les décrets-lois sur les transports en France. (6 500 mots.)

1934 385 .113 (.44)
Chronique des transports, n° 9, 10 mai, p. 10.
La Compagnie des Chemins de fer de l'Est en 1933. (4 200 mots.)

Génie civil. (Paris.)

1934 385 .4 (.44) & 656 (.44)
Génie civil, n° 2698, 28 avril, p. 378.
MARCEAU (J. L.). — Modifications apportées aux conventions et au cahier des charges des Grands Réseaux de Chemins de fer français. (3 300 mots & fig.)

1934 691
Génie civil, n° 2698, 28 avril, p. 365.
La confection rationnelle du béton, d'après les recherches de la Commission autrichienne du béton armé. (1 200 mots.)

1934 656 (.44)
Génie civil, n° 2698, 28 avril, p. 386.
La coordination des transports ferroviaires et routiers. Décret-loi du 19 avril 1934. (700 mots.)

1934 656 .222.1 (.43)
Génie civil, n° 2698, 28 avril, p. 386.
PONDEVEAUX (L.). — L'accélération des relations ferroviaires en Allemagne. (700 mots.)

1934 625 .143.3
Génie civil, n° 2699, 5 mai, p. 400.
MERKLEN (J.) & VALLOT (E.). — Ruptures et avaries accidentelles des rails. Etat actuel de la question et améliorations à envisager. (4 000 mots & fig.)

1934 656 .254
Génie civil, n° 2699, 5 mai, p. 406.
THOMAS (J.). — Nouveau procédé de signalisation lumineuse applicable aux passages à niveau. (1 600 mots & fig.)

1934 **62. (01**

Génie civil, n° 2699, 5 mai, p. 407.

Les appareils de mesure de la **dureté superficielle.** (2 500 mots & fig.)

1934 **625 .143.3**

Génie civil, n° 2700, 12 mai, p. 420.

MERKLEN (J.) & VALLOT (E.). — **Ruptures et avaries accidentelles des rails.** Etat actuel de la question et améliorations à envisager (fin). (3 000 mots & fig.)

1934 **62. (01 & 624 .2**

Génie civil, n° 2700, 12 mai, p. 433.

Méthode nouvelle pour calculer les **contraintes élastiques dans une pièce de section variable** soumise à des efforts combinés de flexion et de compression. (1 400 mots.)

1934 **624 .8 (.42)**

Génie civil, n° 2701, 19 mai, p. 441.

Le **pont levant** de 81 mètres de portée sur la Tees à Newport, près Middlesbrough (Angleterre). (2 300 mots & fig.)

1934 **669 .1**

Génie civil, n° 2701, 19 mai, p. 446.

SEIGLE (J.). — Un nouveau diagramme fer-carbone pour les **aciers** et quelques-unes de ses conséquences. (3 100 mots & fig.)

1934 **621 .132.8 (.44)**

Génie civil, n° 2701, 19 mai, p. 453.

Automotrice à vapeur, système Sentinel-Cammell, du Chemin de fer du Nord. (600 mots & fig.)

La Traction électrique. (Paris.)

1934 **621 .33 (.436)**

La Traction Electrique, janvier, p. 3.

KAAN (E.). — **L'électrification** des Chemins de fer fédéraux autrichiens dans le passé et dans l'avenir. (4 200 mots & fig.)

1934 **621 .335 & 621 .43**

La Traction Electrique, janvier, p. 11.

MÜLLER (A. E.). — Considérations sur la **traction Diesel-électrique.** (2 700 mots & fig.)

L'Economie internationale. (Paris.)

1934 **656 .1 & 656 .2**

L'Economie internationale, mai, p. 8.

La **coordination** de la route et du rail. (1 500 mots.)

Les Chemins de fer et les Tramways. (Paris.)

1934 **621 .335**

Les Chemins de fer et les Tramways, mai, p. 106.

Locomotive électrique à alimentation mixte : ligne aérienne ou accumulateurs. (2 600 mots & fig.)

1934 **621 .335 & 621**

Les Chemins de fer et les Tramways, mai, p. 110.

Dispositifs pour **locomotives Diesel-électriqu** (3 600 mots & fig.)

1934 **625 .2**

Les Chemins de fer et les Tramways, mai, p. 112.

Roues élastiques pour automotrices. (2 600 m & fig.)

1934 **621 .33 (.4**

Les Chemins de fer et les Tramways, mai, p. 116.

VIÉ (G.). — Les **travaux** en cours et les projets la Compagnie du Midi. (2 800 mots & fig.)

1934 **625 .2**

Les Chemins de fer et les Tramways, mai, p. 118.

Attelages automatiques. (2 700 mots & fig.)

1934 **625 .13 (.4**

Les Chemins de fer et les Tramways, mai, p. 121.

DUCHESNOY. — La réfection des **viaducs** de ligne de Paris à Versailles Rive Droite. (4 000 m & fig.)

1934 **625 .12 & 625 .1**

Les Chemins de fer et les Tramways, mai, p. 125.

Galeries de protection des voies ferrées contre avalanches, les rochers et les neiges. (2 200 m & fig.)

1934 **656 .21**

Les Chemins de fer et les Tramways, mai, p. 127.

GLATIGNY. — L'emploi du rocasphalte pour **revêtements des cours de gares, des trottoirs et** quais. (2 100 mots.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1934 **621 .13**

L'Industrie des voies ferrées et des transports au mobiles, avril, p. 97.

LABORIE (J.). — Les **autorails** J. L. (5 100 m & fig.)

1934 **621 .33 (.4**

L'Industrie des voies ferrées et des transports au mobiles, avril, p. 256.

SCHEURER (Ch.). — Description et **résultats** l'électrification de réseaux de chemins de fer d'intér local français. (9 300 mots & fig.)

L'Officiel des approvisionnements. (Paris.)

1934 **669**

L'Officiel des approvisionnements, 15 mai, p. 6.

PELOU. — Documentaire des **approvisionnemen** (4 000 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1934 **621 .8**

Ossature métallique, avril, p. 178.

DUPONT (L.). — Considérations sur la construction des **ponts roulants.** (2 500 mots & fig.)

1934 **721 .9**

Ossature métallique, avril, p. 195.

ROS. — Les **constructions acier-béton** système « Al- a ». (3 200 mots & fig.)

Rail et route. (Paris.)

1934 **656**

il et route, avril, p. 3.

Pour une **politique des transports.** (9 100 mots.)

Revue générale des chemins de fer. (Paris.)

1934 **656 .23 (0 (.44)**

vue générale des chemins de fer, mai, p. 409.

BRION. — La **tarification** des chemins de fer fran- s. Son évolution depuis la guerre. (17 000 mots.)

1934 **656 .212.5 (.44)**

vue générale des chemins de fer, mai, p. 434.

RIDET (J.). — La **gare de triage** de Vaires. (9 800 ts & fig.) (A suivre.)

1934 **656 (.44)**

vue générale des chemins de fer, mai, p. 454.

Conclusions du Conseil National Economique sur le blème **des transports** en France. (3 400 mots.)

1934 **621 .43 (.82)**

vue générale des chemins de fer, mai, p. 468.

Résultats en service des **locomotives Diesel-électri-** s du Great Southern Railway de Buenos-Ayres. 500 mots.)

Revue politique et parlementaire. (Paris.)

1934 **385 (.44) & 656 (.44)**

vue politique et parlementaire, 10 mai, p. 230.

PESCHAUD (M.). — La **restauration** des chemins fer et la **coordination des transports.** (12 000 mots.)

Revue universelle des Mines. (Liége.)

1934 **656 .253**

vue universelle des mines, n° 9, 1er mai, p. 234.

HLARD (P.), SWINGS (P.) et BRASSEUR (H.). Le principe de la **signalisation lumineuse de jour** le problème physique des verres de signalisation. 400 mots & fig.)

1934 **656 .1**

vue universelle des mines, n° 10, 15 mai, p. 270.

DEMARET (E.). — Développement **des transports automobiles.** (2 900 mots & fig.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

1934 **313 .385 (.3)**

Archiv für Eisenbahnwesen, Januari/Februari, S. 1.

AUERSWALD. — Die **Eisenbahnen der Erde** im Jahr 1931. (1 800 Wörter.)

1934 **656 .231**

Archiv für Eisenbahnwesen, Januari/Februari, S. 13.

GRETSCH (R.). — Zur **Tariffrage** Städtischer Verkehrsunternehmen. (13 500 Wörter.)

1934 **656 .211.7 (.4)**

Archiv für Eisenbahnwesen, Januari/Februari, S. 57.

SERAPHIN (P. H.). — Die Entwicklung der **Eisenbahnfähren** im deutschskandinavischen Verkehr. (6 500 Wörter.)

1934 **385. (09 (.43)**

Archiv für Eisenbahnwesen, Januari/Februari, S. 77.

ESSELBRÜGGE. — Die **Abhängigkeit des norddeutschen Eisenbahnnetzes von der Geländegestaltung.** (18 000 Wörter & Abb.)

1934 **385 .113 (.45)**

Archiv für Eisenbahnwesen, Januari/Februari, S. 131.

Die **italienischen Staatsbahnen** im Rechnungsjahr 1931/1932. (4 600 Wörter.)

1934 **313 .385 (.42)**

Archiv für Eisenbahnwesen, Januari/Februari, S. 153.

Die **Eisenbahnen** Grossbritanniens 1931 und 1932. (4 000 Wörter.)

Elektrische Bahnen. (Berlin.)

1934 **621 .33 (.439)**

Elektrische Bahnen, Heft 4, April, S. 73.

von VEREBÉLY (L.). — **Betriebserfahrungen** auf der mit 50 Hz Wechselstrom **elektrisierten Linie** Budapest-Hegyeshalom. (3 400 Wörter & Abb.)

1934 **621 .332**

Elektrische Bahnen, Heft 4, April, S. 79.

FORWALD (H.). — Die **Energie-Übertragungsfähigkeit** der bei Wechselstrombahnen gebräuchlichen Fahrleitungs-Speisesysteme, insbesondere bei 50 Hz. (4 000 Wörter & Abb.)

1934 **621 .33**

Elektrische Bahnen, Heft 4, April, S. 90.

TÄUBER (K.). — Ein widerstandsabhängiges Relais für **Fahrleistungsnetze.** (1 300 Wörter & Abb.)

1934 **621 .33 (.436)**

Elektrische Bahnen, Heft 4, April, S. 93.

KAAN (E. R.). — Die **Elektrisierung** der Südrampe der Tauernbahn. (900 Wörter.)

Glasers Annalen. (Berlin.)

1934 **385. (09 (.73)**

Glasers Annalen, Heft 8, 15. April, S. 59.

WERNEKKE. — **Forschung und Fortschritt** im Eisenbahnwesen der Vereinigten Staaten. (3 700 Wörter.)

Organ für die Fortschritte des Eisenbahnwesens. (Berlin.)

1934 **656 .1 (.43) & 656 .261 (.43)**

Organ für die Fortschritte des Eisenbahnwesens, Heft 9, 1. Mai, S. 159.

WOLFGANG BODE. — Das Fahrzeug der Deutschen Reichsbahn für die **Beförderung von Eisenbahnwagen auf der Strasse.** (6 400 Wörter & Abb.)

1934 **621 .133.1 & 621 .133.2**

Organ für die Fortschritte des Eisenbahnwesens, Heft 9, 1. Mai, S. 168.

EBERT. — **Verbrennung und Verschlackung** auf dem Lokomotivrost. (7 000 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 **62. (01 & 669 .1**

Zeitsch des Ver. deutsch. Ing., Nr. 18, 5. Mai, S. 565.

Dauerfestigkeit und Kerbzähigkeit von Stahl bei niedrigen Temperaturen. (300 Wörter.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 **656 .211 (.43)**

Zeitsch. für das gesamte Eisenb.-Sicherungswesen, Nr. 6, 1. Mai, S. 73.

EULER (H.). — **Betriebsüberwachung** im Hauptpersonenbahnhof Frankfurt (M.). (2 000 Wörter & Abb.) (Fortsetzung folgt.)

1934 **656 .253**

Zeitsch. für das gesamte Eisenb.-Sicherungswesen, Nr. 6, 1. Mai, S. 76.

BUDDENBERG. — Das **dreibegriffige Vorsignal.** (1 500 Wörter & Abb.)

Zeitung des Vereins Mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 **625 .1 (.45)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 17, 26. April, S. 309.

BECKER. — Die **Eröffnung der neuen Linie Bologna-Florenz.** (1 900 Wörter & Abb.)

1934 **656 .224 (.436)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 17, 26. April, S. 312.

BAZANT (F.). — **Kurzzüge** mit geschobenen und gezogenen Personenwagen im Wiener Nahverkehr. (1 800 Wörter.)

1934 **624 (.494)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 18, 3 Mai, S. 325.

BÜHLER. — **Eisenbahnbrücken** der Schweizerischen Bundesbahnen. (3 500 Wörter & Abb.)

1934 **656 .1 (.43) & 656 .254 (.43)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 18, 3. Mai, S. 332.

JASCHKOWITZ. — Die **fahrlässige Eisenbahntransportgefährdung** durch Kraftfahrer im Lichte des deutschen Strafrechts. (1 500 Wörter.)

1934 **385 .1 (.43)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 19, 10. Mai, S. 341.

STEGNER (A.). — Aus dem **Gebiete des Geldwesens der Reichsbahn.** (8 300 Wörter.)

1934 **621 .132.8 & 656 .225**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 19, 10. Mai, S. 351.

BURGER. — Die **Beförderung der eiligen Güter** nach Einführung des **Triebwagenverkehrs.** (1 200 Wörter.)

1934 **625 .142.1**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 20, 17. Mai, S. 367.

SALLER. — Grundsätzliches zur **Eisenbahnquerschwellenfrage.** (700 Wörter & Abb.)

In English.

Engineer. (London.)

1934 **347 .75 & 621 .39**

Engineer, No. 4086, May 4, p. 450.

THORP (H. R. M.). — **Specifications for electrical installations.** (1 900 words & fig.)

1934 **621 .331 (.42)**

Engineer, No. 4086, May 4, p. 452.

Glass bulb **rectifiers** on the L. M. S. Ry. (1 300 words & fig.)

1934 **621 .9 (.42)**

Engineer, No. 4086, May 4, p. 454.

Railway coach woodworking machine. (800 words & fig.)

1934 **621 .14 & 621 .43**

Engineer, No. 4086, May 4, p. 458.

FOWLER (Sir Henry). — **The progress of automobile engineering.** (4 300 words.)

1934 **621 .43 (.42)**

Engineer, No. 4086, May 4, p. 463.

Oil locomotive for L. M. S. Ry. (450 words & fig.)

1934 **621 .165**

Engineer, No. 4087, May 11, p. 470.
Engineer, No. 4088, May 18, p. 496.

The development of the Parsons **steam turbine.** (7 300 words & fig.)

1934 **627 (.65) & 656 .213 (.65)**
gineer, No. 4087, May 11, p. 475.
he Mustapha Jetty, Algiers. (1 800 words & fig.)

1934 **621 .392 (.42) & 621 .138.6 (.42)**
gineer, No. 4087, May 11, p. 477.
abricated locomotive cylinders. (200 words & fig.)

1934 **621 .31**
gineer, No. 4087, May 11, p. 512.
Vater circuit breakers. (1 000 words & fig.)

Engineering. (London.)

1934 **62. (01 & 669**
gineering, No. 3564, May 4, p. 503.
OODACRE (R.). — **The mounting of wire for fati- testing.** (2 600 words & fig.)

1934 **536, 62. (01 & 669**
gineering, No. 3564, May 4, p. 506.
AILEY (R. W.). — **Thermal stresses in pipe joints high pressures and temperatures.** (1 600 words ig.)

1934 **621 .43 (.73)**
gineering, No. 3564, May 4, p. 509.
treamlined train on the Union Pacific Railroad. 200 words & fig.)

1934 **621 .43 (.42)**
gineering, No. 3564, May 4, p. 510.
leavy-oil engine shunting locomotives. (1 400 words table.)

1934 **625 .214**
gineering, No. 3564, May 4, p. 512.
ow-frictional coefficient plain journal bearing. (1 400 rds & fig.)

1934 **621 .43**
gineering, No. 3564, May 4, p. 512.
he « high-speed » gas producer for motor vehicles. 100 words & fig.)

1934 **621 .9**
gineering, No. 3564, May 4, p. 521.
xtension type vertical boring and turning mill. 0 words & fig.)

1934 **621 .14 & 621 .43**
gineering, No. 3564, May 4, p. 523.
OWLER (Sir Henry). — **The progress of automo- e engineering.** (3 500 words & fig.)

1934 **621 .18**
gineering, No. 3564, May 4, p. 526.
HALLOW (M. G. S.). — **The Velox steam genera-** (2 900 words, tables & fig.)

1934 **621 .18**
gineering, No. 3564, May 4, p. 528.
WALLOW (M. G. S.). — **The Velox steam genera-** Paper read at the North Western Branch of the titution of Mechanical Engineers, March 27, 1934. 200 words.)

1934 **621 .43**
Engineering, No. 3565, May 11, p. 535.
SMITH (E. A.). — **The cooling system of the internal combustion engine.** (2 700 words.)

1934 **621 .33 (.436)**
Engineering, No. 3565, May 11, p. 546.
The economics of railway electrification in Austria. (1 300 words.)

1934 **65**
Engineering, No. 3565, May 11, p. 547.
ELBOURNE (E. T.). — **Workshop organisation and management.** (4 800 words.)

1934 **691**
Engineering, No. 3565, May 11, p. 550.
The preservation of wooden poles. (1 200 words & fig.)

1934 **621 .43**
Engineering, No. 3565, May 11, p. 556.
FOWLER (Sir Henry). — **The progress of automobile engineering.** (1 300 words.)

1934 **625 .26**
Engineering, No. 3565, May 11, p. 557.
SAMS (J. G. B.). — **The periodical overhauling of steel railway wagons.** (1 900 words.)

1934 **621 .43 (.44)**
Engineering, No. 3566, May 18, p. 568.
High-speed rail-car for the French State Railway. (1 000 words & fig.)

1934 **621 .31**
Engineering, No. 3566, May 18, p. 581.
Water circuit-breakers for St.-Albans substation. (900 words & fig.)

Engineering News-Record. (New York.)

1934 **624 .2**
Engineering News-Record, No. 17, April 26, p. 534.
ELLIS (Ch. A.). — **Simplified analyses of indeterminable frames.** (4 500 words & fig.)

1934 **624 .51 (.73)**
Engineering News-Record, No. 17, April 26, p. 541.
Construction progress on the Golden Gate bridge. (2 500 words & fig.)

1934 **624 .1 (.73) & 624 .32 (.73)**
Engineering News-Record, May 10, p. 589.
Pier sinking through sand islands at New Orleans. (3 800 words & fig.)

1934 **625 .13 (.73)**
Engineering News-Record, May 10, p. 597.
MAUGHMER (G. F.). — **Designing tunnel ventilation for construction use.** (4 400 words, 3 tables & fig.)

Indian Railway Gazette. (Calcutta.)

1934 656 .23 (.42)
Indian Ry. Gazette, May, p. 105.
Searching for **railway traffic** in Great Britain. (2 100 words.)

Journal, Institution of Engineers, Australia. (Sydney, N. S. W.)

1934 621 .31
Journal, Institution of Engineers, Australia, March, p. 79.
HARPER (H. R.). — **Power resources and requirements.** (10 000 words & fig.)

Journal, Institute of Transport. (London.)

1934 656 .251
Journal, Institute of Transport, May, p. 298.
JENKIN JONES (C. M.). — **Railway colour light signalling** from an operating point of view. (13 000 words.)

1934 387
Journal, Institute of Transport, May, p. 316.
HURD (Sir Archibald). — **The State and shipping.** The influence of the past on recent developments. (18 000 words.)

Journal, Permanent Way Institution. (Woking.)

1934 625 .17 (.42)
Journal, Perm. Way Institut., April, p. 61.
HILLS (H.). — Systematic **maintenance of permanent way** on the L. N. E. R., North Eastern Area. (4 500 words.)

1934 625 .13 (.42) & 625 .17 (.42)
Journal, Perm. Way Institut., April, p. 76.
ROCK (L. G. B.). — **The realignement and regrading of track in tunnels.** (6 600 words & fig.)

1934 625 .14 (01
Journal, Perm. Way Institut., April, p. 93.
BASSINDALE (H. H.). — Some notes on **permanent way** matters. (5 800 words & fig.)

Journal, Western Society of Engineers. (Chicago)

1934 624 (.71)
Journal, Western Society of Engineers, April, p. 17.
DISNEY (Ch. P.). — **New developments in grade separation structures.** (4 300 words & fig.)

Mechanical Engineering. (New York.)

1934 621 .133.7 & 725 .33
Mechanical Engineering, May, p. 273.
APPLEBAUM (S. B.). — **Water treatment** for boiler feed. (3 800 words & fig.)

Modern Transport. (London.)

1934 621 .43 (.42
Modern Transport, No. 790, May 5, p. 3.
FOWLER (Sir Henry). — **Progress of automobi engineering.** Developments in Great Britain. (2 8 words.)

1934 385 .14 (.42
Modern Transport, No. 791, May 12, p. 3.
Problem of railway revenue. Inquiry by rates tr bunal. (1 200 words & tables.)

1934 621 .43 (.73
Modern Transport, No. 791, May 12, p. 5.
A stainless steel articulated streamlined train. Th Burlington « Zephyr » to be exhibited at Chicag (3 000 words & fig.)

1934 385 .14 (.42
Modern Transport, No. 791, May 12, p. 5.
Industrial traffic management. — **Proceedings Railway Rates Tribunal.** (2 100 words.)

1934 621 .43 (.42
Modern Transport, No. 791, May 12, p. 8.
Oil engines for railway service. L. M. S. **shunting loco motives.** (600 words & fig.)

Proceedings, American Society of Civil Engineers (New York.)

1934 62. (01 & 62
Proceed., Amer. Soc. of Civil Engineers, May, p. 652.
MOLITOR (D. A.). — **Wave pressures on sea-wal and breakwaters.** (3 900 words & fig.)

1934 624 .
Proceed., Amer. Soc. of Civil Engineers, May, p. 758.
PAVLO (E. L.). — A generalized deflection theory fo **suspension bridges.** (1 600 words.)

1934 62 (01 & 72
Proceed., Amer. Soc. of Civil Engineers, May p. 770
JOHNSON (L. H.), BEDNARSKI (E. J.), WHIT (M. P.) & KARTZKE (P. L.). — Flexible « first-st ry » construction for **earthquake-resistance.** (3 90 words & fig.)

Proceedings, Institution of Civil Engineers. (London.)

1934 624 .3 (.54
Proceed., Institut. Civil Engineers, Vol. 235, p. 36.
MAIR (R.). — **The Willingdon bridge, Calcutt** (35 000 words & fig.)

1934 621 .4
Proceed., Institut. Civil Engineers, Vol. 235, p. 129.
MOORE (J. Th.). — The present position of th pressure-charged **heavy-oil engine.** (18 000 words & fig

.934 627
ceed., Institut. Civil Engineers, Vol. 235, p. 175.
UTCHER (A. D. D.) & DEKEYNE ATKINSON (J.).
The causes and prevention of **bed erosion**, with spe-
reference to the protection of structures control-
rivers and canals. (42 000 words & fig.)

1934 625 .13 (.54)
ceed., Institut. Civil Engineers, Vol. 235, p. 281.
ORRIE (Ch. M.). — The river Hooghly **tunnel**.
000 words & fig.)

Railway Age. (New York.)

1934 625 .111 (.73)
ilway Age, No. 16, April 21, p. 570.
Thirty five **main line grade crossings** to be eliminated
the city of Syracuse in New York Central project.
900 words & fig.)

1934 385 .1 (.42)
ilway Age, No. 16, April 21, p. 577.
SHERRINGTON (C. E. R.). — 1933. **A year of inno-**
tions for British Railways. (1 700 words.)

1934 625 .234 (.73)
ilway Age, No. 17, April 28, p. 601.
Pennsylvania makes rapid progress in air conditio-
ng. (1 400 words & fig.)

1934 385 .3 (.73)
ilway Age, No. 17, April 28, p. 605.
FLETCHER (R. V.). — **Eastman's challenge to the**
ilroad industry. (5 000 words.)

1934 625 .142.2 (.73)
ilway Age, No. 17, April 28, p. 613.
Tie requirements can be forecast. (1 900 words &
.)

1934 656 .261 (.73)
ilway Age, No. 17, April 28, p. 619.
Reading truck traffic marked by steady growth.
000 words & fig.)

1934 656 .1 (.73)
ilway Age, No. 17, April 28, p. 621.
Rail-highway operations of 1933 reviewed in annual
ports. (2 200 words.)

1934 725 .33 (.73)
ilway Age, No. 18, May 5, p. 646.
Unusual train shed replaces old structure at Chicago.
000 words & fig.)

1934 625 .23 (0 & 625 .211
ilway Age, No. 18, May 5, p. 652.
RAGSDALE (E. J. W.). — **Effect of streamlining**
ilway passenger equipment cars. (2 600 words &
.)

Railway Engineer. (London.)

1934 621 .392
Railway Engineer, May, p. 137.
New portable Diesel set for welding crossings. (500 words & fig.)

1934 625 .113, 621 .135.4 & 625 .215
Railway Engineer, May, p. 139.
JACKSON (P. H.). — **Transition curves.** (3 300 words & fig.)

1934 621 .14 & 621 .134.1
Railway Engineer, May, p. 142.
JONES (G. F.). — **Metallic packings for high pressure.** (1 100 words & fig.)

1934 621 .138.5, 621 .392 & 625 .26
Railway Engineer, May, p. 144.
BONDY (O.). — **Welding** in the construction of locomotives and railcars. (2 000 words & fig.)

1934 621 .132.6 (.42)
Railway Engineer, May, p. 149.
New locomotives for the L. M. S. Ry. (1 800 words & fig.)

1934 621 .9 (.42)
Railway Engineer, May, p. 155.
New machines recently installed in the carriage works at Swindon, G. W. Ry. (300 words & fig.)

1934 656 .253 (.42)
Railway Engineer, May, p. 157.
The re-signalling of the York-Northallerton main line, L. N. E. Ry. (3 300 words & fig.)

1934 621 .392 (.42) & 625 .15 (.42)
Railway Engineer, May, p. 164.
HARRISON (F. E.). — **Repairing cast manganese crossings by welding.** (900 words & fig.)

Railway Gazette. (London.)

1934 625 .232 (.42)
Railway Gazette, No. 18, May 4, p. 787.
Modern British **railway carriage construction.** (2 000 words & fig.)

1934 621 .39 & 621 .87
Railway Gazette, No. 18, May 4, p. 796.
Crane control at Inchicore. (600 words & fig.)

1934 625 .244 (.45)
Railway Gazette, No. 18, May 4, p. 797.
Italian refrigerator vans for English traffic. (400 words & fig.)

1934 625 .216
Railway Gazette, No. 19, May 11, p. 837.
A gauge-adjustable bogie. (800 words & fig.)

1934 **656 .256.3 (.460)**
Railway Gazette, No. 19, May 11, p. 839.
Automatic block signalling, Northern Railway of Spain. (1 000 words & fig.)

1934 **656 .1 (.42)**
Railway Gazette, No. 19, May 11, p. 843.
Passenger vehicles for country services. (600 words & fig.)

1934 **698**
Railway Gazette, No. 19, May 11, p. 845.
Up-to-date **road vehicle painting.** (800 words & fig.)

1934 **621 .94 (.42)**
Railway Gazette, No. 19, May 11, p. 847.
Constructing « **Castle** » **class express engines,** G. W. Ry. (700 words & fig.)

1934 **621 .13 (0**
Railway Gazette, No. 20, May 18, p. 873.
TUPLIN (W. A.). — **The form of steam locomotives.** (2 100 words.)

1934 **656 .253 (.945)**
Railway Gazette, No. 20, May 18, p. 875.
A new **power signaling installation** on the Victorian Railways. (1 300 words & fig.)

1934 **621 .392 (.42) & 621 .138.5 (.42)**
Railway Gazette, No. 20, May 18, p. 878.
Welding on an L. M. S. Ry. locomotive. (200 words & fig.)

1934 **656 (.42)**
Railway Gazette, No. 20, May 18, p. 884.
The internal **air services** of Great Britain. (700 words & fig.)

1934 **385. (091 (.51)**
Railway Gazette, No. 20, May 18, p. 886.
Present position of Chinese Railways. (1 500 words.)

1934 **621 .33 (.489)**
Electric Railway Traction, p. 812, Supplt. to the Railw. Gazette, May 4.
Copenhagen suburban system. (1 200 words & fig.)

1934 **621 .333**
Electric Railway Traction, p. 814, Supplt. to the Railw. Gazette, May 4.
FLETCHER (G. H.). — **Modern developments in traction motor design.** An authoritative review of progress during the past decade. (3 400 words & fig.)

1934 **621 .33 (.45)**
Electric Railway Traction, p. 818, Supplt. to the Railw. Gazette, May 4.
Italian Railway electrification. (3 700 words, tables & fig.)

1934 **621 .43 (.493)**
Diesel Railway Traction, p. 896, Supplt. to the Railw. Gazette, May 18.
Diesel railcar development in Belgium. (4 900 words, tables & fig.)

1934 **621 .43 (.73**
Diesel Railway Traction, p. 904, Supplt. to the Railw Gazette, May 18.
The Burlington « Zephyr ». (2 500 words & fig.)

1934 **621 .335 (.492) & 621 .43 (.492**
Diesel Railway Traction, p. 908, Supplt. to the Railw Gazette, May 18.
Forty Diesel trains for Holland. (2 600 words & fig.

1934 **621 .43 (.42**
Diesel Railway Traction, p. 915, Supplt. to the Railw Gazette, May 18.
160 B. H. P. shunting locomotive, L. M. S. Ry. (1 30 words & fig.)

1934 **621 .43 (.42**
Diesel Railway Traction, p. 916, Supplt. to the Railw Gazette, May 18.
Two British-built Diesel locomotives for India. — Light duty units with two stroke engines. (750 words & fig.)

1934 **621 .43 (.436**
Diesel Railway Traction, p. 918, Supplt. to the Railw Gazette, May 18.
STUART MIALL. — **Transmissions for Diesel locomotives and railcars.** The Voith-Sinclair **turbo-converter.** (1 600 words & fig.)

Railway Engineering and Maintenance. (Chicago, Ill.)

1934 **625 .123 (.73)**
Railway Engineering & Maintenance, May, p. 260.
Sound **roadbed** pays its way. Surface drainage (2 900 words & fig.)

1934 **625 .123 (.73)**
Railway Engineering & Maintenance. May, p. 264.
Hows and whys of **jacking culverts.** (3 000 words & fig.)

1934 **625 .142.2 (.73) & 691 (.73)**
Railway Engineering & Maintenance, May, p. 269.
von SCHRENK (H.). — **Termites.** Methods for combating them. (1 900 words & fig.)

1934 **625 .212 & 625 .143.3**
Railway Engineering & Maintenance, May, p. 271.
CLARKE (D. M.). — **Rail and flange lubrication.** (2 400 words & fig.)

1934 **625 .175 (.73)**
Railway Engineering & Maintenance, May, p. 273.
GUTELUIS (F. P.). — Reducing the hazard of **motor car operation.** (2 000 words & fig.)

1934 **621 .392 & 625 .17**
Railway Engineering & Maintenance, May, p. 275.
CANDY (A. M.). — **Arc welding** in railroad maintenance. (3 000 words & fig.)

Railway Signaling. (Chicago.)

1934 **625 .151 (.73)**
ilway Signaling, May, p. 241.
Spring switch on the Chicago Great Western. (1 200 rds & fig.)

1934 **385 .3 (.73) & 656 .254 (.73)**
ilway Signaling, May, p. 243.
Propose repeal of **train control** law. (1 700 words fig.)

1934 **656 .253 (.42)**
ilway Signaling, May, p. 244.
Paddington power signaling. (1 900 words & fig.)

1934 **625 .162 (.73) & 656 .259 (.73)**
ilway Signaling, May, p. 247.
Automatic and manual control for **crossing signals** the Boston & Maine. (800 words & fig.)

1934 **656 .29 (.73)**
ilway Signaling, May, p. 249.
An automatic **wheel counter** on the Union Pacific. 200 words & fig.)

1934 **656 .258 (.73)**
ilway Signaling, May, p. 251.
SMITH (B. L.). — **South Shore reconstructs interlocking.** (1 100 words & fig.)

1934 **625 .162 & 656 .254**
ilway Signaling, May, p. 253.
COLEY (N. B.). — The **highway-crossing signal** circuit problem. (2 700 words & fig.)

1934 **313 : 656 .284 (.73)**
ilway Signaling, May, p. 255.
Pennsylvania Commission report of highway crossing **cidents.** (2 000 words & 1 table.)

1934 **656 .253 (.71)**
ilway Signaling, May, p. 256.
HARVEY (A. M.). — **Approach lighting** on the Canadian National. (700 words & fig.)

The Locomotive. (London.)

1934 **621 .13 (0**
he Locomotive, May 15, p. 133
Steam still predominant. (1 200 words & fig.)

1934 **621 .132.3 (.42)**
he Locomotive, May 15, p. 134.
Three-cylinder 4-6-0 passenger engine with tapered oiler, L. M. & S. Ry. (1 000 words & fig.)

1934 **621 .132.3 (.437)**
he Locomotive, May 15, p. 137.
4-8-2 three-cylinder passenger locomotive, Czechoslovakian State Railways. (700 words & fig.)

1934 **621 .131.2**
The Locomotive, May 15, p. 139.
PHILLIPSON (E. A.). — **Steam locomotive design.** Data and formulæ. Chapter XI. Compound expansion. Factors affecting distribution of work over cylinders. (1 400 words.)

1934 **385. (091 (.945)**
The Locomotive, May 15, p. 140.
ROLLAND (J. C. M.). — **Inspection tour on the Victorian Railways.** (3 000 words & fig.)

1934 **621 .335 (.43), 621 .43 (.43) & 656 .221 (.43)**
The Locomotive, May 15, p. 144.
The « Flying Hamburger ». (1 400 words & fig.)

1934 **621 .13 & 621 .43**
The Locomotive, May 15, p. 146.
Some aspects of modern **railway traction.** (3 000 words.)

1934 **621 .13 (0**
The Locomotive, May 15, p. 152.
Partial **re-numbering of locomotives,** L. M. & S. Ry. (700 words & fig.)

1934 **621 .335**
The Locomotive, May 15, p. 156.
Electric locomotive design. VIII. — Individual axle drives. (1 000 words & fig.)

1934 **621 .335 (.489) & 621 .43 (.489)**
The Locomotive, May 15, p. 162.
Diesel-electric trains, Danish State Railways. (900 words & fig.)

Transit Journal. (New York.)

1934 **625 .174 & 625 .62**
Transit Journal, May, p. 144.
Snow fighting methods modernized. (2 600 words & fig.)

1934 **388 (.43) & 625 .4 (.43)**
Transit Journal, May, p. 154.
KOFFMANN (J. L.). — **Berlin expands rapid transit.** (1 600 words & fig.)

In Spanish.

Ferrocarriles y Tranvias. (Madrid.)

1934 **621 .43 (.44)**
Ferrocarriles y Tranvias, abril, p. 158.
AZA (P.). — **Francia y los automotores.** (4 800 palabras.)

1934 **656 .1 & 656 .2**
Ferrocarriles y Tranvias, abril, p. 164.
La carretera y el ferrocarril. (12 000 palabras.)

Gaceta de los Caminos de hierro. (Madrid.)

1934 **656 .1 (.460) & 656 .2 (.460)**

Gaceta de los Caminos de hierro, nº 3709, 1 de abril, p. 37.

El Servicio de **Coordinación de Transportes** de las Compañías de los Caminos de Hierro del Norte y Madrid-Zaragoza-Alicante. (400 palabras.)

Ingenieria y Construcción. (Madrid.)

1934 **624 .2**

Ingenieria y Construcción, abril, p. 249.

CASADO (C. F.). — Teoria de las **losas continuas sobre columnas.** (5 500 palabras, 2 cuadros & fig.)

1934 **621 .43**

Ingenieria y Construcción, abril, p. 279.

HAHN (T.). — **Automotores Diesel eléctricos** con regulación automática de la potencia. (1 200 palabras & fig.)

Los Transportes. (Madrid.)

1934 **656 .23 (0**

Los Transportes, nº 373, 15 de abril, p. 120.

MERINO (J.). — **Teorética del tráfico.** El precio de coste de los transportes por ferrocarril. (2 000 palabras.)

Revista de Obras Públicas. (Madrid.)

1934 **624 .63 (.460)**

Revista de Obras Públicas, nº 9, 1º de mayo, p. 167.

VILLALBA (C.). — El **puente** del Adaja, en arco elíptico de hormigón armado. (4 500 palabras & fig.)

1934 **691**

Revista de Obras Públicas, nº 10, 15 de mayo, p. 186.

ANGULO (A.). — **Hormigón armado.** (1 700 palabras & fig.)

1934 **624**

Revista de Obras Públicas, nº 10, 15 de mayo, p. 191.

CASADO (C. F.). — Colección de **puentes de altura estricta.** (1 500 palabras & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1934 **621 .3**

Annali dei lavori pubblici, dicembre, p. 1079.

ASTA (A.). — I materiali impiegati nell' **elettrotecnica.** (10 000 parole & fig.)

La tecnica profesionale. (Firenze.)

1934 **621 .133.2**

La tecnica profesionale, maggio, p. 126.

VELOX. — Come si controlla una buona **condotta del fuoco della locomotiva.** (1 800 parole & fig.)

L'Ingegnere. (Roma.)

1934 **625 .1 (.45**

L'Ingegnere, nº 9, 1 maggio, p. 423.

La **direttissima Bologna-Firenze.** (500 parole & fig.

1934 **69**

L'Ingegnere, nº 10, 16 maggio, p. 498.

COLONNETTI (G.) & ZUNINI (B.). — Ancora proposito delle **prove sui cementi.** (1 000 parole & fig.

Rivista tecnica delle ferrovie italiane. (Roma.)

1934 **621 .335 (.45**

Rivista tecnica delle ferrovie italiane, 15 aprile, p. 18

BIANCHI (G.). — La unificazione delle **locomotiv elettriche** a corrente continua a 3 000 volt. (7 000 parole & fig.)

1934 **625 .122 (.45**

Rivista tecnica delle ferrovie italiane, 15 aprile, p. 20

GOTELLI (R.). — La **frana** di Noli Linea Sampier darena-Ventimiglia. (2 100 parole & fig.)

1934 **385 (.44**

Rivista tecnica delle ferrovie italiane, 15 aprile, p. 21

GIOVENE (N.). —**Il nuovo regime** delle ferrovie fran cesi. Luglio 1933. (4 900 parole.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **62. (0**

De Ingenieur, nº 18, 4 Mei, p. A. 160.

DRIESSEN (G.). — **Knikproeven** van constructies va samengestelde doorsnede met geringe slankheid. (1 10 woorden & fig.)

1934 **621 .43 (.492**

De Ingenieur, nº 18, 4 Mei, p. A. 163.

Proefritten met **Diesel-electrische tractie.** (900 woor den & fig.)

1934 **69**

De Ingenieur, nº 18, 4 Mei, p. Bt. 35.

TREVES (E.). — **Trilbeton.** (3 900 woorden & fig.

1934 **69**

De Ingenieur, nº 18, 4 Mei, p. Bt. 40.

BOONSTRA (G. C.). — Onderzoek van onder wate gestort **beton.** (2 100 woorden & fig.)

1934 **65**

De Ingenieur, nº 20, 18 Mei, p. T. 19.

de VRIES (F.). — Beginselen van **verkeers-economie** (2 300 woorden.)

934 62. (01 & 669

Ingenieur, nº 20, 18 Mei, p. Mk. 19.

'OLFF (E. B.). — **Toelaatbare spanningen by meta-** in verband met de materiaal-eigenschappen. (7 200 rden, 2 tabellen & fig.)

Spoor- en Tramwegen. (Utrecht.)

934 625 .14 (01 (.92)

or en Tramwegen, nº 10, 8 Mei, p. 249.

E WIT (A. N. P.). — De **bovenbouwberekenings-**ze van de Staatspoor en Tramwegen in Nederland-ie. (1 600 woorden & fig.) (Wordt vervolgd.)

934 656 .1 (.42) & 656 .2 (.42)

or en Tramwegen, nº 10, 8 Mei, p. 257.

ARTHURTON (A. W.). — De engelsche **road and** l traffic act van 1933. (3 600 woorden.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1934 **385 (.469)**

Gazeta dos caminhos de ferro, nº 1113, 1 de maio, p. 135.

de SOUSA (J. F.). — Estudos ácérca dos **caminhos de ferro** do Estado. (2 300 palavras & fig.)

1934 **621 .13**

Gazeta dos caminhos de ferro, nº 1113, 1 de maio, p. 240.

COLAÇO (L. F.). — **As locomotivas a vapor** fo seu progresso. (1 500 palavras.)

Revista das Estradas de ferro. (Rio de Janeiro.)

1934 **656**

Revista das Estradas de ferro, nº 209, 30 de março, p. 429.

A coordinação dos meios de transporte terrestres. (3 700 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

AUGUST 1934

016. 385. (02]

I. — BOOKS.

In French.

934 **347 .763.4**

RRE (R.).

ecueil pratique des transports à l'usage des expé-urs et des destinataires pour l'application des prin-s du contrat de transport par chemins de fer.

aris (9e), 2 volumes (15×23), 250 et 150 pages. ix: 1re partie, 20 francs français; 2e partie, 8 francs nçais; les 2 volumes, 26 francs français.)

---

934 **385 (.44)**

DFERNAUX (R.).

es Grands Réseaux de Chemins de fer français. iée 1933.

aris (VIe), Dunod, 92, rue Bonaparte. 1 fascicule, pages.

---

934 **621 .89**

VRE (H.).

es idées modernes sur les carburants, les lubrifiants a lubrification.

aris (6e), Ch. Béranger, 15, rue des Saints-Pères Liége, 1, quai de la Grande-Bretagne. (Prix: 50 francs nçais.)

---

934 **691 & 694**

TE.

e séchage des bois.

aris, Dunod, 92, rue Bonaparte. 1 volume, 172 pages 8 figures. (Prix: 39 francs français.)

---

934 **621 .134.3 (.73)**

VARDE (P.).

a locomotive à haute pression L. F. Loree, du Dela-e and Hudson Railroad.

aris, Société d'Encouragement pour l'Industrie na-ale. 1 brochure (extrait du Bulletin de mars 1934 adite Association), 13 pages et figures.

1934 **385 .587**

LE CHATELIER (H.).

Le taylorisme.

Paris (6e), Dunod, 92, rue Bonaparte. 1 volume (16 × 25), 240 pages et figures. (Prix: 24 francs français.)

1934 **531**

NACHTERGAL (A.).

Guide pour l'exécution des dessins de machines.

Paris (6e), Ch. Béranger, 15, rue des Saints-Pères. 1 volume (12 × 21), 96 pages et 112 figures. (Prix: 18 francs français.)

1934 **656 .213**

Notice générale sur la construction des embranchements industriels.

Paris (9e), Société de Construction d'Embranchements Industriels, 80, rue Taitbout.

1934 **385. (08 (.493)**

Société Nationale des Chemins de fer vicinaux. Rapports présentés par le Conseil d'administration et par le Comité de surveillance. Année 1933.

Bruxelles, S. N. C. F. V., rue de la Science. 1 volume, 151 pages et 1 carte.

In German.

1934 **621 .43**

Die Diesellokomotive mit unmittelbarem Antrieb.

Berlin (NW.7.), VDI. Verlag. 1 Band. (Preis: 5 R.M.)

1934 **621 .116 & 691**

KROHNKE (O.) & STIEGLER (D. L.).

Die Entstehung und Verhütung der Korrosion an Heizungs- und Warmwasserbereitungsanlagen.

Halle a.d. Saale, Carl Haenchen. 1 Band, 152 Seiten und 42 Abbildungen. (Preis: 5 R.M.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress jointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to ilway Science », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 1509).

1934 62. (01 & 621

LEHR (E.).

Schwingungstechnik.

Berlin, Julius Springer. 1 Band, 373 Seiten und 243 Abbildungen. (Preis: 31.50 R.M.)

1934 656 .23 (0

METZGER (R.).

Die Differentialpreise im Verkehr, ihr Wesen, ihre Ursachen und ihre Bedeutung.

Zürich, Zürcher Volkswirtschaftlhicen Forschungen.

1934 621 .116

MUNZINGER (F.).

Dampfkraft.

Berlin, Julius Springer. 1 Band, 44 Rechenbeispielen, 41 Zahlentafeln und 566 Abbildungen. (Preis: 40 R.M.)

1934 656 .235 (.436)

RUDZKI (W.).

Das österreichische Eisenbahntarifsystem für den Güterverkehr.

Schramberg (Würtemberg), Gatzer & Hahn, 1 Band, 130 Seiten.

1934 621 .132.8 (.42) & 621 .43 (.42)

STRAUSS (F.).

Vollbahn-Triebwagen der Englischen Eisenbahnen.

Wien, Generaldirektion der Oesterreichischen Bundesbahnen. 1 Bericht, 19 Seiten.

1934 691

TROCHE (A.).

Grundlagen des Eisenbetonbaues.

Berlin und Leipzig, Walter de Gruyter & Co. 1 Band, 143 Seiten, 15 Tafeln mit 62 Abbildungen. (Preis : 1.62 R.M.).

1934 656 .224 (.4)

Zusammenstellung der wichtigsten Bestimmungen für den Reiseverkehr auf den Eisenbahnen europäischer Länder.

Berlin (W.9), Verein Mitteleuropäischer Eisenbahnverwaltungen. 1 Band. (Preis: 4 R.M.).

In English.

1934 62. (01 (06 (.73) & 669 .1 (.73)

American Society for Testing Materials.

Impact testing of cast iron. Report of Subcommittee XV of Committee A-3 on cast iron.

Philadelphia (U.S.A.). Published by the Association. (6 × 9 inches), 747 pages, illustr., diagrams, charts, tables. (Price: $ 5.00.)

1934 621 .392 & 665 .882

ATKINS (E. A.).

Electric arc and oxy-acetylene welding.

London. Sir Isaac Pitman & Sons, Ltd. Second edition. (Price: 7 sh. 6 d. net.)

1934 621 .8

BOSTON (O. W.).

Engineering shop practice. Vol. I.

New York, John Wiley & Sons, Inc. London, Chapman & Hall, Ltd. (Price: 34 sh. net.)

1934 656 .2

COX (H. E.), signal engineer, Great Indian Peninsul Railway.

Report on oil burners and wicks for signal lamp

Delhi. The Manager of Publications. Technical Pape No. 287. 47 pages & fig. (Price: Annas 7 or 9 d.)

1934 32

DU PLAT TAYLOR (M.).

The design, construction and maintenance of dock wharves and piers.

London, E.C. 4, Ernest Benn, Ltd., 154, Fleet Stree (Price: 45 sh. net.)

1934 385. (09 (.73) & 656 .22 (.73

HENRY (Robert Selph).

Trains.

Indianapolis (U. S. A.). Published by The Bobb Merrill Co. (9 × 13 inches), 105 pages, photograph (Price: $ 2.50.)

1934 385. (0

HOLMSTROM (J. Edwin).

Railways and roads in pioneer development.

Overseas: A study of their comparative economic

London, S. W. 1. P. S. King & Son, Ltd., Orchar House, Westminster. 304 pages, tables & fig. (Pric 15 sh. net.)

1934 621 .3

IBBETSON (W. S.), B. Sc.

Accumulator charging, maintenance and repair.

London, W. C. 2. Sir Isaac Pitman and Sons, Lt Parker Street. (Price: 3 sh. 6 d. net.)

1934 62. (01 & 621 .4

JUDGE (Arthur W.).

The testing of high-speed internal-combusti engines.

London. Chapman and Hall, Ltd. Second editi revised and enlarged. (Price: 25 sh.)

1934 624 .63 & 721

MANNING (G. P.), M. Eng., A. M. Inst. C. E.

Reinforced concrete arch design.

London, W. C. 2. Sir Isaac Pitman & Sons Lt Parker Street. (9 × 6 inches), 190 pages, illustr. (Pric 12 sh. 6 d.)

1934 621 .133.1 (06 (.7

Proceedings. International Railway Fuel Associati 1933.

Chicago. T. Duff Smith, secretary. 1660. Old Colo Building. 126 pages, bound in red leather.

1934 62. (01 & 621 .39

ULLIN (V. E.), C. B. E.

Engineering radiography.

London, W. C. 2. G. Bell & Sons, Ltd., York House, ortugal Street. (Price: 45 sh. net.)

1934 621 .13 (09

EED (Brian).

Railway engines of the World.

London. Humphrey Milford, Oxford University Press. rice: 3 sh. 6 d. net.)

1934 62. (01 & 621 .39

T. JOHN (Ancel) & ISENBURGER (H. R.).

Industrial radiography.

London. Chapman & Hall. New York, John D. Wiley Sons. Inc. (Price: 21 sh. 6 d. net.)

In Spanish.

1934 385. (08 (.460)

OMPANIA DE LOS FERROCARRILES DE MADRID A ZARAGOZA Y A ALICANTE.

Memoria que presenta el Consejo de Administración la Junta General de Señores accionistas el 27 de ayo de 1934. Ejercicio de 1933.

Madrid, Sucesores de Rivadeneyra (S. A.). — Artes ráficas, Paseo de San Vicente, nº 20. 1 volumen, 19 páginas y cuadros.

1934 625 .162 & 656 .254

ORENO (R. S.).

El problema de los pasos a nivel.

Madrid, Asociación General de transportes por vía errea. 1 volumen, 70 páginas y figuras.

1934 385. (02

AZQUEZ (J. H.).

Geografia ferroviaria.

Monforte (Lugo), Vázquez, J., calle del Dr. Casares, 106. 1 volumen, 186 páginas, fotografias y grabados. (Precio: 5 pesetas.)

In Italian.

1934 621 .33 (.45)

LALONI (N.).

L'elettrificazione ferroviaria nei suoi aspetti economici e finanziari.

Roma, Supergrafica Lolli. 1 volume, 20 pagine.

1934 624 .2

SANTARELLA (L.).

Gli sforzi secondari nelle travi a traficcio in cemento armato.

Milano, Atti Ricerche Studi. 1 volume, 93 pagine e 30 figure. (Prezzo: 15 Lire.)

In Dutch.

1934 385 .113 (.92)

NEDERLANDSCH-INDISCHE SPOORWEG MAATSCHAPPIJ.

Verslag over het jaar 1933.

's-Gravenhage, Beheer van de N. I. S. Maatschappij. 1 boek. 50 blz.

In Polish.

1934 693

KALKOWSKI (T. J.).

Torkretnictwo. Betonowanie pod cisnieniem sprezonego powietrza i jego zastosowanie w budownictwie.

Warszawa, Nakladem Czasopisma « Cement », tom IV, nr 1. 2. 5. 7. 9. 10 (11). 12. 102 str. & rys.

[016. 385. (05]

II. — PERIODICALS.

In French.

Annales des travaux publics de Belgique. (Bruxelles.)

1934 62. (01 & 691

Annales des travaux publics de Belgique, avril, p. 171.

RABOZÉE (H.) — Le retrait et les variations de empérature des bétons. (10 600 mots & fig.)

1934 691

Annales des travaux publics de Belgique, avril, p. 243.

DUTRON (R.). — Le retrait des ciments, mortiers t bétons. (20 700 mots, 13 tableaux.)

Bulletin de la Société d'encouragement pour l'industrie nationale. (Paris.)

1934 385 .587 (.44)

Bull. de la Soc. d'encouragement pour l'ind. nat., mai, p. 348.

SATET (R.). — L'organisation du travail au Chemin de fer du Nord. (2 200 mots.)

Bulletin de l'Union internationale des chemins de fer. (Paris.)

1934 385 .113 (.436)

Bull. de l'Union intern. des chem. de fer, mars, p. 77.

Les Chemins de fer fédéraux autrichiens. 1923-1933. (9 200 mots.)

1934 **385 .4 (.43)**
Bull. de l'Union intern. des chem. de fer, mars, p. 88.
L'**unification administrative** des chemins de fer allemands. (5 300 mots.)

1934 **656 .211.7 (.42 + .44)**
Bull. de l'Union intern. des chem. de fer, mars, p. 94.
Un service de **ferry-boats** entre Dunkerque et Douvres. (1 600 mots.)

1934 **656**
Bull. de l'Union intern. des chem. de fer, mars, p. 99.
Services aériens des chemins de fer. (900 mots).

1934 **385 .113 (.3)**
Bull. de l'Union intern. des chem. de fer, mars, p. 101.
Comparaison des **recettes et dépenses d'exploitation** des chemins de fer pour les exercices 1927 à 1933. (4 000 mots.)

1934 **385 .113 (.437)**
Bull. de l'Union intern. des ch. de fer, avril-mai, p. 125.
Les **Chemins de fer de l'Etat tchécoslovaque** (1928-1932). (10 000 mots.)

1934 **385 (.498)**
Bull. de l'Union intern. des ch. de fer, avril-mai, p. 146.
Les Chemins de fer roumains. Rapport sur l'exécution de leur **programme d'amélioration.** (6 300 mots.)

1934 **385 .1 (.44)**
Bull. de l'Union intern. des ch. de fer, avril-mai, p. 154.
Mesures récemment prises en France en vue d'améliorer la **situation financière** des Grands Réseaux de chemins de fer. (4 400 mots.)

1934 **625 .4 (.45)**
Bull. de l'Union intern. des ch. de fer, avril-mai, p. 159.
La **ligne direttissima** de Bologne à Florence. (1 400 mots.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1934 **621 .33 (.485)**
Bull. des transp. intern. par ch. de fer, mai, p. 275.
Electrification des Chemins de fer de l'Etat suédois. (900 mots & 2 tableaux.)

1934 **656 .1 (.437)**
Bull. des transp. intern. par ch. de fer, juin, p. 320.
Résumé sommaire des prescriptions de la loi du 23 décembre 1932 sur les **transports automobiles** en Tchécoslovaquie. (5 300 mots.)

1934 **313 .385 (.439)**
Bull. des transp. intern. par ch. de fer, juin, p. 337.
Statistiques des Chemins de fer royaux de l'Etat hongrois pour l'exercice 1932-33. (700 mots.)

Bulletin technique de la Suisse romande. (Vevey.)

1934 **625 .62**
Bull. techn. de la Suisse romande, nº 11, 26 mai, p. 126.
WANNER. — **Modernisation** des réseaux de tramways. (1 300 mots & fig.)

1934 **691**
Bull. techn. de la Suisse romande, nº 11, 26 mai, p. 129.
Confection rationnelle du **béton.** (1 200 mots.)

1934 **625 .5 (.494)**
Bull. techn. de la Suisse romande, nº 13, 23 juin. p. 146.
MULLER (A. E.). — Le **funiculaire** Davos-Parsenn. (2 600 mots & fig.)

Chronique des transports. (Paris.)

1934 **656 (.44)**
Chronique des transports, nº 10, 25 mai, p. 2.
La **coordination** du rail et de la voie navigable. (2 200 mots.)

1934 **385 .113 (.44)**
Chronique des transports, nº 10, 25 mai, p. 5.
La Compagnie des **Chemins de fer du Midi** en 1933. (6 000 mots.)

1934 **656 .1 (.44) & 656 .2 (.44)**
Chronique des transports, nº 11, 10 juin, p. 3.
La **coordination** du rail et de la route : le « Pacte de Rouen ». (7 500 mots.)

1934 **385 .113 (.44)**
Chronique des transports, nº 11, 10 juin, p. 11.
La **Compagnie du P. L. M.,** en 1933. (4 000 mots.)

Génie civil. (Paris.)

1934 **669 .1**
Génie Civil, nº 2702, 26 mai, p. 465.
SEIGLE (J.). — Un nouveau diagramme fer-carbone pour les **aciers** et quelques-unes de ses conséquences. (3 000 mots & fig.)

1934 **727 .4 (.45)**
Génie Civil, nº 2703, 2 juin, p. 481.
CALFAS (P.). — Le **politecnico** de Milan. (5 200 mots & fig.)

1934 **62. (01 & 691**
Génie Civil, nº 2703, 2 juin, p. 491.
MARCOTTE (E.). — **L'élasticité du ciment et du béton,** armé ou non. (2 300 mots & fig.)

1934 **33 & 385 .56**
Génie Civil, nº 2704, 9 juin, p. 507.
RAZOUS (P.). — Le **chômage,** l'assurance-chômage et les grands travaux publics. (4 800 mots & fig.)

1934 621 .116
énie Civil, no 2704, 9 juin, p. 511.
Les systèmes automatiques de **réglage de la chauffe** ıns les chaudières. (5 400 mots & fig.)

1934 625 .235
énie Civil, no 2705, 16 juin, p. 543.
Les pistolets pneumatiques pour la **pulvérisation des** :intures et vernis. (800 mots & fig.)

1934 624 .63 (.44)
énie Civil, no 2706, 23 juin, p. 556.
SOUILLOT (H.). — Le nouveau **pont en béton de** ment fondu pervibré sur la Loire, à Saint-Thibault Cher). (3 800 mots & fig.)

1934 621 .89
énie Civil, no 2706, 23 juin, p. 560.
RABATE (H.) & DEVEZ (G.). — Le problème du :aissage et l'emploi du graphite colloïdal. (4 800 mots fig.)

1934 62. (01 & 721 .9
énie Civil, no 2706, 23 juin, p. 566.
Le **photo-élasticimètre** Mabboux, et son emploi pour tude des **ouvrages en béton.** (600 mots & fig.)

1934 621 .33 (.436)
énie Civil, no 2706, 23 juin, p. 569.
L'**électrification** des Chemins de fer autrichiens. (500 ots & carte.)

La Science et la Vie. (Paris.)

1934 621 .392
a Science et la Vie, juillet, p. 3.
REGNAULD (P.). — Les procédés modernes de udure ont révolutionné les constructions métalliques. 100 mots & fig.)

es Chemins de fer et les Tramways. (Paris.)

1934 621 .335 (.73) & 621 .43 (.73)
es Chemins de fer et les Tramways, juin, p. 132.
SPIESS (E.). — **Train automoteur articulé Diesel-**ectrique du Chicago-Burlington and Quincy Railroad. 900 mots & fig.)

1934 625 .232
s Chemins de fer et les Tramways, juin, p. 138.
Wagons-lits à compartiments individuels. (1 800 mots fig.)

1934 621 .89 & 625 .214
es Chemins de fer et les Tramways, juin, p. 141.
Le **graissage par film d'huile.** (7 000 mots & fig.)

1934 625 .234
s Chemins de fer et les Tramways, juin, p. 148.
DESGARDES (A.). — **Poêle-ventilateur** pour voi-ures de chemins de fer. (2 100 mots & fig.)

1934 625 .142.4
Les Chemins de fer et les Tramways, juin, p. 150.
Traverse en béton armé pour voies ferrées. (1 800 mots & fig.)

1934 625 .4
Les Chemins de fer et les Tramways, juin, p. 152.
DUCHESNOY. — Le **railplane.** (2 000 mots & fig.)

1934 625 .13 (.44)
Les Chemins de fer et les Tramways, juin, p. 154.
CHARRIN (V.). — Le **tunnel** de la Croix-de-l'Horme, près Saint-Etienne. (2 400 mots & fig.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1934 625 .6 (.44)
L'Ind. des voies ferrées et des transp. autom., mai, p. 121.
Le **réseau de la Corse** de la Compagnie de chemins de fer départementaux. (9 300 mots, 1 carte & fig.)

1934 621 .133.1
L'Ind. des voies ferrées et des transp. autom., mai, p. 135.
Les **huiles lourdes combustibles** dérivées du pétrole. (2 200 mots.)

1934 621 .33 (.44)
L'Ind. des voies ferrées et des transp. autom., mai, p. 273.
GIRARD & GAYRARD. — **Electrification** de la ligne de Lyon à Neuville et considérations sur l'exploitation de la ligne. (7 700 mots, 7 tableaux & fig.)

1934 621 .132.8 & 621 .43
L'Ind. des voies ferrées et des transp. autom., mai, p. 294.
PERIN (R.). — Comparaison dans l'exploitation entre les **automotrices à essence** et les **automotrices à huile lourde.** (5 700 mots et fig.)

L'Ossature métallique. (Bruxelles.)

1934 669 .1
L'Ossature métallique, mai, p. 262.
MASI (F.). — La **ductilité de l'acier.** (800 mots & fig.)

Revue de l'Ecole polytechnique. (Bruxelles.)

1934 625 .213
Revue de l'Ecole polytechnique, février, p. 213.
MINSART (E.). — Les **oscillations des ressorts de suspension** du matériel de chemin de fer. (2 300 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1934 **621 .133.1 (.44) & 621 .138.2 (.44)**
Revue générale des chemins de fer, juin, p. 495.
BARRIER. — La nouvelle **politique des charbons** de la traction aux chemins de fer de l'Etat. (9 000 mots et fig.)

1934 **656 .212.5 (.44)**
Revue générale des chemins de fer, juin, p. 514.
RIDET (J.). — La **gare de triage** de Vaires. (8 400 mots & fig.)

1934 **385 (.65)**
Revue générale des chemins de fer, juin, p. 534.
La **réorganisation** des chemins de fer d'intérêt général en Algérie. (5 600 mots.)

1934 **656 .253 (.43)**
Revue générale des chemins de fer, juin, p. 543.
La **signalisation des ralentissements** sur la Reichsbahn. (2 300 mots & fig.)

Revue politique et parlementaire. (Paris.)

1934 **385 .1**
Revue politique et parlementaire, 10 juin, p. 551.
DIVISIA (F.). — Revue des questions de transport. **Les chemins de fer.** (5 200 mots.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

1934 **385 .113 (.436)**
Archiv für Eisenbahnwesen, Heft 2, März-April, S. 317.
ROESNER (E.). — Die **österreichischen Bundesbahnen** im Jahr 1931. (6 500 Wörter.)

1934 **313 .385 (.494)**
Archiv für Eisenbahnwesen, Heft 2, März-April, S. 349.
NITSCHKE. — Die **Eisenbahnen** der Schweiz im Jahr 1931. (1 500 Wörter.)

1934 **385 .113 (.44)**
Archiv für Eisenbahnwesen, Heft 2, März-April, S. 357.
NITSCHKE. — Die **Betriebsergebnisse** der fünf grossen französischen Eisenbahngesellschaften im Jahr 1932. (1 700 Wörter.)

1934 **385 .113 (.52)**
Archiv für Eisenbahnwesen, Heft 2, März-April, S. 371.
Die **Eisenbahnen Japans** in den Rechnungsjahren 1930-1931 und 1931-1932. (3 900 Wörter.)

Die Lokomotive. (Wien).

1934 **621 .132.3 (.44) & 621 .134.4 (.44)**
Die Lokomotive, Mai, S. 77.
2 D-Umbau-Vierzylinder-Verbund-Schnellzug-Lokomotive der Paris-Orléans-Bahn. (2 800 Wörter & Abb.)

1934 **621 .132.8 (.436)**
Die Lokomotive, Mai, S. 81.
Die heutige Bedeutung der **leichten Elbel-Lokomotive** als wirtschaftliche Nebenbahntype im **Kampfe mit dem Auto-Triebwagen.** (3 400 Wörter & Abb.)

1934 **621 .132.3 (.44)**
Die Lokomotive, Juni, S. 97.
Die neuen **Schnell- und Personenzugslokomotiven** der Paris-Lyon-Mittelmeer-Bahn. (5 200 Wörter & Abb.)

Elektrische Bahnen. (Berlin.)

1934 **621 .335 (.43)**
Elektrische Bahnen, Mai, S. 97.
TETZLAFF (H.). — **Elektrische Co-Co Güterzuglokomotive,** Gattung E 93, der Deutschen Reichsbahn. (5 800 Wörter & Abb.)

1934 **385 .59 (.43)**
Elektrische Bahnen, Mai, S. 110.
KOTHER (H.). — Über die Möglichkeiten selbsttätiger **Wirkungsgrad-, Leistungs- und Arbeitsmessungen** mit besonderer Berücksichtigung ortsfester und fahrbarer Maschinen des Eisenbahnbetriebes (D. R. P. angemeldet). (3 900 Wörter & Abb.) (Fortsetzung folgt.)

1934 **621 .33**
Elektrische Bahnen, Mai, S. 115.
LUITHLEN (H.). — **Stromsystem und Energieversorgung** elektrischer Bahnen auf dem Internationalen Elektrizitäts-Kongress in Paris 1932 und auf der skandinavischen Tagung der Weltkraftkonferenz 1933. (2 700 Wörter & Abb.)

Glasers Annalen. (Berlin.)

1934 **621 .132.8 & 621 .4**
Glasers Annalen, Heft 9, 1. Mai. S. 65.
HENNIG (R.). — **Warum Schnelltriebwagen mit unmittelbaren Dieselmotorenantrieb ?** (3 700 Wörter & Abb.)

1934 **625 .25**
Glasers Annalen, Heft 9, 1. Mai, S. 69.
HILDEBRAND (F.). — Eine neue Ausführung der **Hildebrand-Knorr-Bremse** für Güterzüge. (1 500 Wörter & Abb.)

Organ für die Fortschritte des Eisenbahnwesens. (Berlin.)

1934 **38**
Organ für die Fortschritte des Eisenbahnwesens, Heft 10, 15. Mai, S. 27.
REMY. — Der **grosstädtische Eisenbahnverkehr** im Dienste der Volkswirtschaft. (6 200 Wörter & Abb.)

1934 **624**
Organ für die Fortschritte des Eisenbahnwesens, Heft 10, 15. Mai, S. 187.
ROSTECK (W.). — Stand und Entwicklung der Verfahren zur **Erforschung der Wirkungen bewegter Verkehrslasten auf Eisenbahnbrücken.** (6 100 Wörter & Abb.)

1934 **624. (0**
gan für die Fortschritte des Eisenbahnwesens, Heft 11, 1. Juni, S. 197.
ROSTECK (W.). — Stand und Entwicklung der Verfahren zur **Erforschung der Wirkungen bewegter Verkehrslasten auf Eisenbahnbrücken.** (5 800 Wörter & Abb.)

1934 **625 .14 (01**
gan für die Fortschritte des Eisenbahnwesens, Heft 11, 1. Juni, S. 206.
NEMESDY-NEMESEK (J.). — Prüfung von **Oberbauberechnungsverfahren** an Hand von Spannungsmessungen. (3 800 Wörter, 3 Tabellen & Abb.)

1934 **625 .14 (01**
rgan für die Fortschritte des Eisenbahnwesens, Heft 11, 1. Juni, S. 211.
JAKY-JANIESEK (J.). — Zur Frage der einheitlichen Berechnung des **Eisenbahnoberbaues.** (3 300 Wörter & Abb.)

1934 **621 .33 (.494)**
rgan für die Fortschritte des Eisenbahnwesens, Heft 12, 15. Juni, S. 33.
EGGENBERGER (H.). — Die Entwicklung und der Betrieb des **elektrifizierten Netzes** der Schweizerischen Bundesbahnen. (2 200 Wörter & Abb.)

1934 **621 .335 (.494)**
rgan für die Fortschritte des Eisenbahnwesens, Heft 12, 15. Juni, S. 220.
STEINER (F.). — **Leichttriebwagen** der Schweizerischen Bundesbahnen. (2 200 Wörter & Abb.)

1934 **656 .254 (.494)**
rgan für die Fortschritte des Eisenbahnwesens, Heft 12, 15. Juni, S. 236.
MÜLLER (W.). — **Zugbeeinflussung** bei den Schweizerischen Bundesbahnen. (2 800 Wörter & Abb.)

1934 **656 .1 (.494) & 656 (.494)**
rgan für die Fortschritte des Eisenbahnwesens, Heft 12, 15. Juni, S. 240.
WANNER (F.). — Die gesetzliche Verkehrsteilung und Zusammenarbeit von **Bahn und Automobil** in der Schweiz. (2 100 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 **62. (01 & 621 .88**
Zeitsch. des Ver. deutsch. Ing., Nr. 22, 2. Juni, S. 661.
BERNDT (G.). — **Gewindetoleranzen** und Festigkeit von Schraubenverbindungen. (1 200 Wörter & Abb.)

1934 **721 .1**
Zeitsch. des Ver. deutsch. Ing., Nr. 22, 2. Juni, S. 663.
GRÜN (R.). — Neuzeitliche **Betonpfahlgründung.** (1 800 Wörter & Abb.)

1934 **62. (01 & 621 .392**
Zeitsch. des Ver. deutsch. Ing., Nr. 23, 9. Juni, S. 709.
BIERETT (G.). — **Versuche zur Ermittlung des Schrumpfspannungen in geschweissten Stumpfnahtverbindungen.** (5 300 Wörter, 2 Tabellen & Abb.)

1934 **625 .2 (01 & 625 .213**
Zeitsch. des Ver. deutsch. Ing., Nr. 23, 9. Juni, S. 721.
LEHR (E.). — Der Einfluss einer Flüsigkeitsdämpfung der **Fahrzeugfederung** auf Bewegungsverlauf und Stosshaftigkeit. (3 800 Wörter & Abb.)

1934 **621 .131.3**
Zeitsch. des Ver. deutsch. Ing., Nr. 24, 16. Juni, S. 729.
NORDMANN (H.). — Ergebnisse neuer **Versuche mit Dampflokomotiven.** (7 500 Wörter & Abb.)

1934 **621 .63 (.43)**
Zeitsch. des Ver. deutsch Ing., Nr. 24, 16 Juni, S. 747.
DISCHINGER (F.). — Die **Adolf-Hitler-Brücke** über die Mosel. (3 200 Wörter & Abb.)

1934 **621 .116**
Zeitsch. des Ver. deutsch. Ing., Nr. 25, 23 Juni, S. 771.
JOSSE (E.). — Untersuchungen am **Löfflerkessel.** (4 200 Wörter, 9 Tafeln & Abb.)

1934 **621 .116**
Zeitsch. des Ver. deutsch. Ing., Nr. 25, 23 Juni, S. 779.
ULSAMER (J.). — Der Dampfzustand im Zylinder einer **Gleichstromdampfmaschine.** (900 Wörter & Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 **656 .253**
Zeitsch. für das gesamte Eisenbahn-Sicherungswesen, Nr. 7, 20. Mai, S. 91.
BUDDENBERG. — Das **dreibegriffige Vorsignal.** (1 500 Wörter & Abb.) (Schluss folgt.)

1934 **656 .211 (.43)**
Zeitsch. für das gesamte Eisenbahn-Sicherungswesen, Nr. 8, 10. Juni, S. 100.
EULER (H.). — **Betriebsüberwachung** im Hauptpersonenbahnhof Frankfurt (M.). (3 200 Wörter & Abb.) (Schluss.)

1934 **656 .253**
Zeitsch. für das gesamte Eisenbahn-Sicherungswesen, Nr. 8, 10, Juni, S. 105.
BUDDENBERG. — Das **dreibegriffige Vorsignal.** (1 400 Wörter & Abb.) (Schluss.)

Zeitung des Vereins Mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 **656 .254**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 21, 24. Mai, S. 377.
HOFMANN (F.). — Einzelheiten über die **optische Zugbeeinflussung.** (3 800 Wörter & Abb.)

1934 **656 .222.1 (.73)**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 21, 24. Mai, S. 383.
Die amerikanische Öffentlichkeit zum Problem der **Verkehrsbeschleunigung.** (1 900 Wörter.)

1934 **656 .254**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 22, 31. Mai, S. 393.
BÄSELER. — Die **Zugbeeinflussung** im Schnellverkehr. (2 000 Wörter & Abb.)

1934 **621 .133.1 (.43)**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 22, 31. Mai, S. 400.
Neuere Ergebnisse der **Brennstoffuntersuchungen** bei der Deutschen Reichsbahn. (1 000 Wörter.)

1934 **656 .235.6 (.42 + .43)**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 23, 7. Juni, S. 409.
REDICKER. — Deutsch-englischer **Güterverkehr.** (2 100 Wörter.)

1934 **625 .23 (0**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 23, 7. Juni, S. 411.
BÄSELER. — Das **Fliehkraftempfinden** in Eisenbahn und Auto. (1 400 Wörter.)

1934 **385 .113 (.42)**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 23, 7. Juni, S. 413.
Die **englischen Eisenbahnen** im Jahre 1933. (2 800 Wörter.)

1934 **385 .113 (.43)**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 24, 14. Juni, S. 425.
JAHN (A.). — Der **Geschäftbericht** der Deutschen Reichsbahn-Gesellschaft über das 9. Geschäftsjahr 1933. (2 600 Wörter.)

1934 **656 .254**
Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 24, 14. Juni, S. 428.
BASELER. — Betriebsforderungen an die **Zugbeeinflussung.** (900 Wörter.)

In English.

Engineer. (London.)

1934 **621 .165**
Engineer, No. 4089, May 25, p. 520; No. 4090, June 1, p. 546.
The development of the Parsons **steam turbine.** (6 800 words & fig.)

1934 **626 .131.4**
Engineer, No. 4089, May 25, p. 528.
Safer **trench piling.** (900 words & fig.)

1934 **621 .132.5 (.73) & 621 .134.3 (.73)**
Engineer, No. 4089, May 25, p. 534.
Delaware and Hudson Ry. — **Triple expansion locomotive.** (1 400 words & fig.)

1934 **621 .43 (.54) & 625 .616 (.54**
Engineer, No. 4089, May 25, p. 536.
Oil-engined locomotives for India. (600 words & fig.

1934 **62. (01, 621 .43 & 66**
Engineer, No. 4089, May 25, p. 537.
STEWART (W. C.). — The relative elasticity c engine **crank shafts.** (2 900 words & 8 tables.)

1934 **621 .132.3 (.42**
Engineer, No. 4090, June 1, p. 551.
L. N. E. Ry. **eight-coupled locomotive.** (3 500 word & fig.)

1934 **725 .36 (.42**
Engineer, No. 4090, June 1, p. 561.
New **grain warehouse** at Leith docks. (1 300 word & fig.)

1934 **621 .16**
Engineer, No. 4091, June 8, p. 572; No. 4092, June 15 p. 596; No. 4093, June 22, p. 620.
The development of the Parsons steam turbine (9 200 words & fig.)

1934 **669 .1 (06 (.42**
Engineer, No. 4091, June 8, p. 574.
The Iron and Steel Institute. — **Annual Spring Meeting,** May 31, June 1, 1934. (7 800 words.)

1934 **621 .335 (.42) & 621 .43 (.42)**
Engineer, No. 4091, June 8, p. 578.
A new **oil-electric locomotive.** (1 500 words & fig.)

1934 **624 .8 (.492)**
Engineer, No. 4091, June 8, p. 580.
The Barendrecht **lift bridge.** (600 words.)

1934 **621 .132.3 (.42)**
Engineer, No. 4091, June 8, p. 583.
A new **2-8-2 locomotive.** (1 400 words.)

1934 **62. (01 & 69**
Engineer, No. 4092, June 15, p. 586, 610.
DIGBY (W. P.) & PATTERSON (J. W.). — Accelerated tests of **paints for steelwork.** (5 500 words.)

1934 **621 .132.8 (.86)**
Engineer, No. 4092, June 15, p. 599.
A **multi-engined locomotive.** (3 700 words & fig.)

1934 **656 .25 (0**
Engineer, No. 4092, June 15, p. 607.
Railway working in fog. (1 500 words.)

1934 **624 .51 (.73)**
Engineer, No. 4093, June 22, p. 622.
The San-Francisco-Oakland **bridge.** (3 200 words & fig.)

1934 **62. (01**
Engineer, No. 4092, June 22, p. 626.
MORRISON (J. L. M.). — A three-ton **testing machine.** (2 200 words & fig.)

1934 621 .43 (.42) & 656 .222.1 (.42)
gineer, No. 4093, June 22, p. 638.
Run of an **oil-engined train.** (250 words.)

1934 62. (01
gineer, No. 4093, June 22, p. 639.
Corrosion. — Iron and Steel Institute. Introduction the second report of the Corrosion Committee. (4 700 rds.)

Engineering. (London.)

1934 621 .132.3 (.43)
gineering, No. 3567, May 25, p. 597.
-4 type **streamlined locomotive,** German State Rail-ys. (400 words & fig.)

1934 656 .222.1 (.44)
gineering, No. 3567, May 25, p. 604.
Lord MONKSWELL. — **Locomotive work in France** 1933. (3 400 words.)

1934 621 .43 (.439)
gineering, No. 3567, May 25, p. 606.
High-speed eight-cylinder Ganz-Jendrassik engine. 300 words & fig.)

1934 62. (01 & 624. (0 & 669 .1
gineering, No. 3567, May 25, p. 607.
Tentative specifications for **steel** for bridges, build-rs. and mild-steel plates. (1 000 words & 1 table.)

1934 621 .132.3 (.42)
gineering, No. 3568, June 1, p. 621.
-2 types **express locomotive** for the London and rth Eastern Railway. (1 200 words & fig.)

1934 62. (01 & 669 .1
gineering, No. 3568, June 1, p. 635.
PEARCE (J. G.). — The elasticity, deflection and ilience of **cast iron.** (3 600 words & tables.)

1934 621 .335 (.42) & 621 .43 (.42)
gineering, No. 3569, June 8, p. 848.
300 HP. **Diesel-electric locomotive.** (2 200 words & .)

1934 621 .94 (.42) & 621 .95 (.42)
gineering, No. 3569, June 8, p. 662.
Turning and boring mill for wheel centres. (700 words fig.)

1934 62. (01, 621 .43 & 669 .1
gineering, No. 3570, June 15, p. 673.
Non-corrosive **internal-combustion engine** cylinder ers. (350 words.)

1934 654
gineering, No. 3570, June 15, p. 687.
Public writing-telegraph service. (1 300 words & fig.)

1934 625 .245
gineering, No. 3570, June 15, p. 692.
Automatic dumping wagon. (400 words & fig.)

1934 62. (01
Engineering, No. 3571, June 22, p. 695.
KOMMERS (J.-B.). — **Elastic strength.** (2 600 words, 6 tables & fig.)

1934 691
Engineering, No. 3571, June 22, p. 697.
WOLMAN (K.) & PFLUG (H.). — **Wood preservation** with water-insoluble salts. (2 600 words, 6 tables & fig.)

1934 51 (08 & 651
Engineering, No. 3571, June 22, p. 699.
The Mallock electrical calculating machine. (3 000 words & fig.)

1934 62 (06 (.42)
Engineering, No. 3571, June 22, p. 710.
Conversazione of the Institution of Civil Engineers, (3 000 words & fig.)

1934 669 .1
Engineering, No. 3571, June 22, p. 713.
Heat treatment of large forgings. (350 words & fig.)

1934 621 .132.3 (.42)
Engineering, No. 3571, June 22, p. 715.
2-8-2 type express locomotive for the L. N. E. Ry. (600 words & fig.)

Engineering News-Record. (New York.)

1934 624 .1 (.71) & 627 (.71)
Engineering News-Record, No. 20, May 17, p. 621.
FREEMAN (G. L.). — **River piers built with land plant from trestle of unique design.** (2 300 words & fig.)

1934 624 .62 (.71)
Engineering News-Record, No. 20, May 17, p. 624.
Cantilever steel erection on Caughnawaga bridge. (1 500 words & fig.)

1934 627 (.44) & 656 .213 (.44)
Engineering News-Record, No. 20, May 17, p. 651.
TRATMAN (E. E. R.). — **Developing the greater port of Havre.** (4 200 words & fig.)

1934 624. (0 (.47)
Engineering News-Record, No. 20, May 17, p. 657.
CHRISTENSEN (C. I.). — **Bridge-building practices** in the U. S. S. R. (3 900 words & fig.)

1934 614 .7 (.73)
Engineering News-Record, No. 22, May 31, p. 683.
Annual waterworks number containing a series of articles on town waterworks.

1934 624 .63 (.485)
Engineering News-Record, No. 23, June 7, p. 727.
Record-span concrete arch built in Stockholm. (1 600 words & fig.)

1934 55 & 62. (01
Engineering News-Record, No. 23, June 7, p. 730.
SEAQUIST (W. H.). — **Accuracy of Goldbeck cell in laboratory tests.** (2 300 words & fig.)

Great Western Railway Magazine. (London.)

1934 **656 .254 (.42)**
Great Western. Ry. Mag., June, p. 269.
BROWNE (C. A.). — **Paddington Station automatic telephone exchange.** (1 400 words & fig.)

Journal, Institution of Engineers, Australia. (Sydney, N. S. W.)

1934 **62. (01, 621 .135.2 & 625 .212**
Journal, Institut. of Engineers, Australia, April, p. 140.
HIRST (G. W. C.). — **The analysis of the stresses in spoked carriage wheels.** (2 700 words & fig.)

Journal, Institute of Transport. (London.)

1934 **38 & 656**
Journal, Institute of Transport, June, p. 356.
BELL (R.). — **Transport developments** in 1933. (6 500 words.)

1934 **347 .763 (.42) & 656 .1 (.42)**
Journal, Institute of Transport, June, p. 365.
NICHOLSON (A. F.). — The **Road Traffic Act, 1930** (Part IV). (3 500 words.)

1934 **621 .43 & 656 .1**
Journal, Institute of Transport, June, p. 376.
STUART PILCHER (R.). — **High speed compression ignition engines** for road passenger transport. (3 300 words & 1 table.)

London & North Eastern Railway Magazine. (London.)

1934 **656 .212.6**
London & North Eastern Ry. Mag., June, p. 306.
MOORE (E. W.). — **Coal: anti-coal breakers.** (900 words & fig.)

Mechanical Engineering. (New York.)

1934 **621 .116**
Mechanical Engineering, June, p. 325.
THRONE (R. F.). — **Burning pulverized lignite.** (3 900 words, 2 tables & fig.)

1934 **621 .116 & 621 .133.7**
Mechanical Engineering, June, p. 341.
APPLEBAUM (S. B.). — **Recent trends in boiler-water treatment.** (5 300 words & fig.)

1934 **625 .234**
Mechanical Engineering, June, p. 361.
Air heating of railway cars. (300 words & fig.)

Modern Transport. (London.)

1934 **625 .11 (.56**
Modern Transport, No. 792, May 19, p. 3.
KEELING (E. H.). — **Railway construction in th** Middle East. The proposed Haifa-Baghdad Railwa (4 700 words & a map.)

1934 **625 .13 (.43) & 625 .245 (.43**
Modern Transport, No. 792, May 19, p. 5.
Tunnel inspection routine in Germany. (1 400 word & fig.)

1934 **347 .763 (.42**
Modern Transport, No. 792, May 19, p. 7.
GAUNT (W. H.). — **Traders and transport legisla tion. Road and rail charges.** (1 800 words.)

1934 **621 .392 (.42) & 625 .13 (.42**
Modern Transport, No. 792, May 19, p. 9.
Electric arc welding. Completion of work on L. M. viaduct. (1 800 words.)

1934 **621 .338 (.42**
Modern Transport, No. 793, May 26, p. 3.
New **rolling-stock** on the Metropolitan Railway. (3 0 words & fig.)

1934 **621 .132.3 (.42**
Modern Transport, No. 793, May 26, p. 5.
New **2-8-2 type express passenger locomotives f** L. N. E. Ry. (500 words & fig.)

1934 **621 .43 (.42**
Modern Transport, No. 793, May 26, p. 7.
An oil-engined shunting locomotive. Drewry unit f L. M. S. Ry. (1 200 words.)

1934 **625 .16**
Modern Transport, No. 793, May 26, p. 9.
Fires adjoining railway lines. A useful preventiv (650 words.)

1934 **625 .6 (06 (.42**
Modern Transport, No. 794, June 2, p. 3.
Problems in passenger transport. — Tramways, Ligh Railways and Transport Association Congress at South end (England). (2 900 words.)

1934 **625 .18 (.42**
Modern Transport, No. 794, June 2, p. 7.
Reclaiming railway equipment. **Permanent way depo** at Darlington (L. N. E. Ry.). (1 800 words & fig.)

1934 **656 .261 (.42**
Modern Transport, No. 794, June 2, p. 9.
Railways and road transport. Developments in York shire area. (2 100 words.)

1934 **656 .212 (.42**
Modern Transport, No. 794, June 2, p. 13.
Handling of railway goods traffic. Important depo in Yorkshire. (1 800 words & fig.)

1934 **621 .335 (.42) & 621 .43 (.42)**
dern Transport, No. 794, June 2, p. 15.
)il-electric locomotive for L. M. S. Ry. — Shunting l general purposes. (1 600 words & fig.)

.934 **625 .26 (.42)**
dern Transport, No. 794, June 2, p. 17.
Building of locomotives, carriages and wagons. Don-ter works of the L. N. E. Ry. (3 000 words & fig.)

1934 **621 .43 (.68)**
dern Transport, No. 794, June 2, p. 19.
Drewry railcar for South African Railways. (1 600 rds & fig.)

1934 **385. (071 (.42) & 656 .25 (.42)**
dern Transport, No. 794, June 2, p. 25.
L. N. E. Ry. signalling school at York. Complete tallation for the training of signal and operating ff. (2 300 words & fig.)

1934 **347 .763 (.42)**
dern Transport, No. 796, June 16, p. 3.
FENELON (K. G.). — **Passenger transport and blic control.** (4 000 words.)

1934 **621 .138.5 (.42) & 656 .21 (.42)**
dern Transport, No. 796, June 16, p. 5.
Railway operation in the West Riding (2 200 words.)

1934 **625 .213 (.42)**
dern Transport, No. 796, June 16, p. 9.
Modern **shipping facilities** in Yorkshire (2 400 words fig.)

1934 **621 .132.8 (.86)**
dern Transport, No. 796, June 16, p. 11.
A new phase in steam locomotion. **Six-engined itish-built units** for Belgian-owned railway in South nerica. (1 900 words & fig.)

1934 **621 .43 & 625 .175**
dern Transport, No. 796, June 16, p. 15.
« **Road-rail freighter** » for railway maintenance. 300 words & fig.)

1934 **621 .132.8 & 621 .43**
dern Transport, No. 796, June 16, p. 20.
TWELVETREES (R.). — **Progress in the heavy hicle industry.** Impressions from a tour in manu-cturing areas. (10 000 words.)

1934 **656**
dern Transport, No. 796, June 16, p. 25.
Transport requirements of industry. **Low rates for avy traffic.** (3 200 words.)

1934 **621 .43 (.41)**
dern Transport, No. 797, June 23, p. 3.
SPEIR (M.). — **Transport developments** in Northern eland. (4 300 words & fig.)

1934 **621 .43 (.42) & 625 .232 (.42)**
dern Transport, No. 797, June 23, p. 5.
Buffet railcars for cross-country services. (2 000 rds & fig.)

1934 **656**
Modern Transport, No. 797, June 23, p. 8.
Transport from a trading point of view. (1 400 words.)

Proceedings, Institution of Railway Signal Engineers. (Reading).

1933-4 **656 .256**
Proceed., Institut. of Ry. Signal Engineers, Part II, October 1933 to January 1934, p. 210.
The problem of overcoming wrong side **failures of track circuits,** caused by sand, rust, grease, etc. (7 900 words.)

1933-4 **656 .25 (0**
Proceed., Institut. of Ry. Signal Engineers, Part II, October 1933 to January 1934, p. 229.
DYER (H. H.). — The financial side of **signalling economics.** (10 000 words.)

1933-4 **656 .251**
Proceed., Institut. of Ry. Signal Engineers, Part II, October 1933 to January 1934, p. 259.
DAVIS (J. S.). — The component parts of a **mechanical signalling plant** and their functions. (4 500 words.)

1933-4 **656 .25 (06 (.42)**
Proceed., Institut. of Ry. Signal Engineers, Part II, October 1933 to January 1934, p. 281.
List of names and addresses of members, 1934.

1933-4 **013 : 656 .25 (06 (.42)**
Proceed., Institut. of Ry. Signal Engineers, Part II, October 1933 to January 1934, p. 321.
Library catalogue.

1933-4 **013 : 656 .25 (06 (.42)**
Proceed., Institut. of Ry. Signal Engineers, Part II. October 1933 to January 1934.
General index of annual reports, meetings, dinners, summer meetings, statement of accounts, papers, obituary notices.

Railway Age. (New York.)

1934 **625 .12 (.73) & 625 .14 (.73)**
Railway Age, No. 19, May 12, p. 682.
TALBOT (A. N.). — Research shows importance of **track substructure.** (3 200 words & fig.)

1934 **621 .43**
Railway Age, No. 19, May 12, p. 685.
The future possibilities of Diesel motive power. (5 600 words.)

1934 **385 .14 (.73) & 656 .1 (.73)**
Railway Age, No. 19, May 12, p. 691.
Revision of western trunk line class rates. (3 500 words.)

1934 **625 .232 (.73)**
Railway Age, No. 20, May 19, p. 727.
Milwaukee develops **unusual coach design.** (3 300 words & fig.)

1934 **385 .1 (.73)**
Railway Age, No. 20, May 19, p. 731.
EASTMAN (J. B.). — **The future of the railroads.** — Attitude of managements and labor seen as two main obstacles. (3 500 words.)

1934 **621 .39 (.73), 625 .18 (.73) & 625 .27 (.73)**
Railway Age, No. 20, May 19, p. 734.
Survey throws spot light on **second-hand material.** (5 900 words.)

1934 **625 .162 (.73) & 656 .254 (.73)**
Railway Age, No. 20, May 19, p. 739.
Both **automatic and manual control for crossing signals.** (700 words & fig.)

1934 **313 : 625 .143.4 (.73)**
Railway Age, No. 20, May 19, p. 743.
BANES (W. C.). — Report reviews **rail failure statistics** for 1932. (1 000 words, 2 tables & fig.)

1934 **385. (064 (.73)**
Railway Age, No. 21, May 26, p. 764.
Railroad exhibits again a center of interest at World's Fair. (4 600 words & fig.)

1934 **347 .75 (.73) & 625 .142.2 (06 (.73)**
Railway Age, No. 21, May 26, p. 769.
Code disturbs tie producers. (2 900 words & fig.)

1934 **621 .43**
Railway Age, No. 21, May 26, p. 773.
Characteristics of the **Diesel engine** in rail-car service. (1 400 words, 1 table & fig.)

1934 **313 : 656 .25 (.73)**
Railway Age, No. 21, May 26, p. 775.
Interstate Commerce Commission. (400 words.)

1934 **621 .134.1 (.73)**
Railway Age, No. 21, May 26, p. 775.
Automatic compensator and snubber for **driving boxes.** (1 700 words & fig.)

1934 **656 .261 (.73)**
Railway Age, No. 21, May 26, p. 782.
Trucks play important part on the New Haven. (2 000 words & fig.)

1934 **656 .261 (.73)**
Railway Age, No. 21, May 26, p. 785.
Pick-up and delivery service proving worth. (1 900 words & fig.)

1934 **625 .1 (.73)**
Railway Age, No. 21, May 26, p. 831.
Santa Fe rebuilds facilities at Oklahoma City. (1 200 words & fig.)

1934 **625 .2**
Railway Age, No. 21, May 26, p. 836.
WALKER (A. R.). — **Air conditioning** of passeng cars. (3 200 words & 6 tables.)

1934 **385 .3 (.7**
Railway Age, No. 21, May 26, p. 839.
Not one of the « brain trust ». (3 000 words.)

1934 **347 .75 (.7**
Railway Age, No. 21, May 26, p. 841.
National Recovery Administration codes for equi ment and appliances. (5 600 words.)

1934 **621 .13**
Railway Age, No. 22, June 2, p. 802.
WINTERROWD (W. H.). — **Importance of mode locomotives to railroad income account.** (4 000 wor & 1 table.)

1934 **621 .133.7 (.7**
Railway Age, No. 22, June 2, p. 805.
Mountain waters impose unusual problem. (1 5 words & tables.)

1934 **385 .525 (.7**
Railway Age, No. 22, June 2, p. 807.
New Haven's pay system rapid. (2 400 words & fig

1934 **656 .24 (06 (.7**
Railway Age, No. 22, June 2, p. 810.
Freight Claim Division holds **annual meeting** at Ne York. (4 600 words.)

1934 **621 .43 (.73) & 656 .222.1 (.7**
Railway Age, No. 22, June 2, p. 819.
Denver to Chicago — Dawn to dusk. **Burlingto** «Zephyr» makes non-stop run of 1 015 miles in thirtee hours and five minutes. (1 400 words & fig.)

Railway Engineer. (London.)

1934 **656 .25**
Railway Engineer, June, p. 172.
CROOK (G. H.). — **Track circuit efficiency.** (2 90 words & fig.)

1934 **62. (01 (.73) & 629. (0 (.73**
Railway Engineer, June, p. 175.
New American **structural steel specifications.** (45 words.)

1934 **621 .392 (.42 + .43) & 665 .882 (.42 + .43**
Railway Engineer, June, p. 176.
BONDY (O.). — **Welding regulations** for buildings bridges and vehicles. (2 400 words & fig.)

1934 **621 .138.5 (.67) & 656 .26 (.67**
Railway Engineer, June, p. 179.
STRAHAN (K. C.). — The locomotive, carriage an wagon **shops** of the Kenya and Uganda Railways. (3 70 words & fig.)

)34 **621 .85 (.42) & 621 .9 (.42)**
way Engineer, June, p. 189.
ew **machine tools for railway shops.** A wheel ncing machine and a turning, boring and bossing e. (1 500 words & fig.)

)34 **625 .23 (09 (.42)**
.way Engineer, June, p. 190.
OON (A. N.). — A century of **railway carriage ding.** Abstract of a paper read before the Institu- of Locomotive Engineers). (4 230 words & fig.)

)34 **621 .132.7 (.42) & 621 .134.1 (.42)**
.way Engineer. June. p. 198.
nk locomotive fitted with reversible booster, . E. Ry. (1 400 words & fig.)

Railway Engineering and Maintenance. (New York.)

)34 **625 .143.3 (.73) & 665 .882 (.73)**
.way Engineering and Maintenance, June, p. 318.
il and welding reaches high peak on Chesapeake hio. (4 700 words & fig.)

)34 **624 .91 (.73)**
way Engineering and Maintenance, June, p. 324.
le trestles. The Atchison, Topeka & Sant Fe Rail- revises designs to meet today's conditions. (1 900 ls & fig.)

)34 **698**
way Engineering and Maintenance, June, p. 327.
st demonstrates economy of **spray painting.** (700 ls & fig.)

)34 **625 .142.2 & 625 .172**
way Engineering and Maintenance, June, p. 329.
eed burners — do they injure creosoted ties? (1 300 ls & fig.)

)34 **625 .143.3 & 625 .144.2**
way Engineering and Maintenance, June, p. 331.
ALDRIDGE (C. W.). — **Should rails on curves be sported?** (1 000 words.)

)34 **625 .144.4 (.73)**
way Engineering and Maintenance, June, p. 332.
ntron develops « **heavy blow** » **tie tamper.** (250 ls & fig.)

Railway Gazette. (London.)

)34 **621 .135.2 (.73)**
.way Gazette. No. 21, May 25, p. 932.
ew **disc-type wheel centres** for coupled wheels. 00 words & fig.)

)34 **624 .51 (.73)**
.way Gazette, No. 21, May 25, p. 934.
ridge building at San Francisco. (500 words & fig.)

1934 **656 .255 (.945)**
Railway Gazette, No. 21, May 25, p. 935.
Electric staff working, Victorian Government Railways. (2 000 words & fig.)

1934 **656 .215**
Railway Gazette, No. 21, May 25, p. 937.
Modern appliances for **lighting.** — II. — Railway stations. (2 700 words & fig.)

1934 **621 .133.8 (.494)**
Railway Gazette, No. 21, May 25, p. 941.
The new Hassler **speed indicator** for locomotives. (300 words & fig.)

1934 **656 .1 (.44) & 656 .27 (.44)**
Railway Gazette, No. 21, May 25, p. 946.
Rail and road co-ordination in France. (1 300 words & a map.)

1934 **621 .132.3 (.42)**
Railway Gazette. No. 22, June 1, p. 965.
New **three-cylinder 2-8-2** type express passenger locomotives, L. N. E. Ry. (1 900 words & fig.)

1934 **385. (091 (.436)**
Railway Gazette. No. 22, June 1, p. 981.
Ten years of the Austrian Federal Railways. (1 400 words.)

1934 **656 .222.1 (.43)**
Railway Gazette. No. 22, June 1, p. 982.
High speed in Germany. (700 words & 2 tables.)

1934 **621 .33 (.492)**
Railway Gazette. No. 22, June 1, p. 992.
Railway electrification in Holland. (2 800 words, tables & fig.)

1934 **621 .335**
Railway Gazette. No. 22, June 1, p. 998.
BEARCE (W. D.). — **Electric locomotive wheel arrangements.** (1 300 words & fig.)

1934 **621 .31**
Railway Gazette. No. 22, June 1, p. 1000.
Mercury arc rectifiers — III. (3 200 words & fig.)

1934 **621 .335 (.73)**
Railway Gazette. No. 22, June 1, p. 1004.
Adhesion efficiency of electric locomotives. (600 words & fig.)

1934 **621 .335**
Railway Gazette, No. 22, June 1, p. 1006.
WHYMAN (F.). — **The adhesion characteristics of locomotives equipped with axle-hung motors.** (2 200 words & fig.)

1934 **621 .132.8 (.86)**
Railway Gazette, No. 24, June 15, p. 1055.
New **Sentinel locomotives** for South America. (2 300 words & fig.)

1934 **621 .132.8 (.73) & 621 .43 (.73)**
Railway Gazette, No. 25, June 22, p. 1099.
American high-speed steam train. (200 words & fig.)

1934 **656 .255 (.47 + .42)**
Railway Gazette, No. 25, June 22, p. 1105.
Single line working in Estonia. (800 words & fig.)

1934 **625 .1 (.82)**
Railway Gazette, No. 25, June 22, p. 1106.
An Argentine State Railway extension. (900 words & fig.)

1934 **654 (.71) & 656 .254 (.71)**
Railway Gazette, No. 25, June 22, p. 1108.
GALLOWAY (D. E.). — **The communication system of the Canadian National Railways.** (1 600 words & fig.)

1934 **656 .22 (.42)**
Railway Gazette, No. 25, June 22, p. 1118.
Passenger train identification on the Great Western Railway. (400 words & fig.)

1934 **621 .43 (.41)**
Diesel Railway Traction, p. 1078, Supplt. to the Ry. Gazette, June 15.
Diesel suburban service in Ulster. (2 300 words & fig.)

1934 **621 .43 (.41)**
Diesel Railway Traction, p. 1081, Supplt. to the Ry. Gazette, June 15.
New Diesel railcar in the Irish Free State. (1 400 words, tables & fig.)

1934 **621 .43 (.42)**
Diesel Railway Traction, p. 1086, Supplt. to the Ry. Gazette, June 15.
Fast cross-country services by railcar. (1 500 words & fig.)

1934 **621 .43**
Diesel Railway Traction, p. 1089, Supplt. to the Ry. Gazette, June 15.
A new railway oil engine. (700 words & fig.)

1934 **621 .335 (.437)**
Diesel Railway Traction, p. 1091, Supplt. to the Ry. Gazette, June 15.
The Blue Arrow. (1 200 words & fig.)

Railway Magazine. (London.)

1934 **625 .17 (.62) & 625 .3 (.62)**
Railway Magazine, June, p. 391.
TAYLOR (G.). — **Railway maintenance in the Desert.** (1 200 words & fig.)

1934 **656 .222.1 (.42)**
Railway Magazine, June, p. 401.
ALLEN (C. J.). — **British locomotive practice and performance.** (3 000 words & tables.)

1934 **385. (091 (.47 + .43)**
Railway Magazine, June, p. 411.
PIERCY (B. J.). — **The State Railways of Latvia.** (1 900 words & fig.)

Railway Mechanical Engineer. (New York.)

1934 **621 .**
Railway Mechanical Engineer, May, p. 141.
SAWYER (R. T.). — **Diesel engines for locomotiv and cars.** (6 400 words & fig.)

1934 **656 .23 (0 & 656 .**
Railway Mechanical Engineer, May, p. 146.
Regaining lost passenger traffic. (1 300 words.)

1934 **621 .43 (.7**
Railway Mechanical Engineer, May, p. 147.
High-speed stainless-steel train built for the Bu lington. (5 600 words & fig.)

1934 **621 .13 (0 (.73) & 621 .138.6 (.7**
Railway Mechanical Engineer, May, p. 154.
Locomotives inadequately depreciated. (3 000 wor & tables.)

1934 **656 .26 (.7**
Railway Mechanical Engineer, May, p. 157.
FAERBER (A. H.). — **Progressive repairing of b cars.** (3 100 words & fig.)

1934 **614 .8 (.7**
Railway Mechanical Engineer, May, p. 163.
PATTERSON (W. J.). — **Work of the Bureau Safety.** (2 000 words.)

Railway Signaling. (Chicago.)

1934 **656 .258 (.7**
Railway Signaling, June, p. 291.
Elgin, Joliet & Eastern installs **electric interlockin** at Drawbridge. (2 700 words & fig.)

1934 **656 .258 (.7**
Railway Signaling, June, p. 295.
Automatic interlocking in Canada. (1 800 words fig.)

1934 **656 .258 (.4**
Railway Signaling, June, p. 297.
New interlocking in Scotland. (2 500 words & fi

1934 **656 .25**
Railway Signaling, June, p. 303.
ZANE (W. F.). — **Electrolysis in the signal fie** (3 900 words.)

The Locomotive. (London.)

1934 **621 .132.3 (.4**
The Locomotive, June 15, p. 169.
Three-cylinder 2-8-2 express locomotive, London a North Eastern Railway. (750 words & fig.)

1934 **621 .132.3 (.4**
The Locomotive, June 15, p. 172.
Two-cylinder Pacific type express locomotiv Alsace-Lorraine Railways. (500 words & fig.)

1934 **621 .335 (.492) & 621 .43 (.492)**
Locomotive, June 15, p. 175.
Diesel-electric trains, Netherlands Railways. (2 000 rds & fig.)

1934 **621 .43 (.68)**
e Locomotive, June 15, p. 178.
;oo-h.p. double power bogie unit for the South ican Railways. (1 700 words & fig.)

1934 **656 .222.1 (09 .42)**
e Locomotive, June 15, p. 182.
The history of the British non-stop express. (3 800 rds & 1 table.)

1934 **621 .335 & 621 .43**
e Locomotive, June 15, p. 189.
The stream-lined Diesel-electric train. (2 800 words, ables & fig.)

1934 **621 .133.7**
e Locomotive, June 15, p. 193.
Treatment of locomotive feed-water. (1 400 words.)

In Spanish.

Anales de la Asociación de Antiguos Alumnos del I. C. A. I. (Madrid.)

1934 **621 .335 (.460)**
nales de la Asociac. de Antiguos alumnos del I. C. A. I., mayo, p. 260.
JACKSON (L.) & LLANOS (S.). — **Locomotoras** éctricas de la Compañía de los Caminos de hierro del orte de España. (4 200 palabras & fig.)

Caminos de hierro. (Madrid.)

1934 **385 .1**
minos de hierro, mayo, p. 107.
MONREAL (M.) & CASTILLO (M.). — **La crisis** rroviaria y sus posibles remedios. (1 600 palabras & g.) (Continuará.)

1934 **625 .234**
minos de hierro, mayo, p. 119.
Ventilación y refrigeración de coches de viajeros. 2 000 palabras & fig.)

Ferrocarriles y Tranvias. (Madrid.)

1934 **651 (.460)**
errocarriles y Tranvias, mayo, p. 188.
BURRULL (J.). — Un aspecto de **racionalización** dministrativa en los ferrocarriles españoles. (1 400 alabras & fig.)

Gaceta de los Caminos de hierro. (Madrid.)

1934 **656 .1 & 656 .2**
Gaceta de los Caminos de hierro, nº 3710, 1 de mayo, p. 49.
La carretera y el ferrocarril. (3 400 palabras & fig.)

Ingenieria y Construcción. (Madrid.)

1934 **624 .2**
Ingenieria y Construcción, junio, p. 369.
CASADO (F.). — Teoria de las **losas continuas sobre columnas.** (3 000 palabras, 7 cuadros & fig.) (Continuará).

Los Transportes. (Madrid.)

1934 **656 .2**
Los Transportes, nº 376, 15 de mayo, p. 149.
MERINO (J.). — **Teorética del tráfico.** (1 200 palabras & fig.)

Revista de Ingenieria Industrial. (Madrid.)

1934 **621 .33 (.45)**
Revista de Ingenieria Industrial, mayo, p. 150.
CHAPULI (J. R.). — La **electrificación** de los ferrocarriles en Italia. (3 600 palabras, 2 mapas & fig.)

Revista del Consejo Administrativo de los Ferrocarriles Nacionales de la República de Colombia. (Bogotá.)

1934 **656 .1 (.73) & 656 .2 (.73)**
Revista del Consejo Admin. de los Ferr. Nac. de la República de Colombia, abril, p. 206.
CAMACHO (G.). — Los ferrocarriles americanos ante la **competencia** de las carreteras. (8 500 palabras.)

Revista de Obras Públicas. (Madrid.)

1934 **624 .2**
Revista de Obras Públicas, nº 11, 1º de junio, p. 209.
PRIETO MORESI (J. E.). — Método de la propagación de momentos en las **estructuras múltiples.** (2 200 palabras & fig.)

1934 **624**
Revista de Obras Públicas, nº 11, 1º de junio, p. 214.
CEBALLOS (R.). — Regulación de los aparatos de apoyo móviles de los **tramos metálicos.** (500 palabras & fig.)

1934 **624 .63 (.460)**
Revista de Obras Públicas, nº 12, 15 de junio, p. 225.
VILLALBA GRANDA (C.). — Un nuevo **puente** sobre el río Tajo. (3 900 palabras & fig.)

1934 **385 .11**
Revista de Obras Públicas, nº 12, 15 de junio, p. 232.
BARCELÓ (J.). — **Problemas ferroviarios.** (2 100 palabras.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1934 **691**
Annali dei lavori pubblici, febbraio, p. 77.
PERIANI (P.). — Risultati di prove comparative sul comportamento di **cementi** in acqua di mare e in acqua dolce. (2 700 parole & 3 quadri.)

1934 **621 .131.3 & 656 .222.1**
Annali dei lavori pubblici, febbraio, p. 107.
BAJOCCHI (U.). — Considerazioni sulla **marcia dei treni** in particolari condizoni di moto vario. (9 200 parole, 2 quadri & fig.)

La tecnica professionale. (Firenze.)

1934 **621 .335**
La tecnica professionale, giugno, p. 145.
I materiali isolanti impiegati nella costruzione delle **locomotive elettriche.** (7 300 parole & fig.)

1934 **621 .135.2**
La tecnica professionale, giugno, p. 158.
Note pratiche per gli operai. Come si calcola lo spessore del bordo dei **cuscinetti delle boccole.** (1 600 parole & fig.)

L'Ingegnere. (Roma.)

1934 **621 .33**
L'Ingegnere, 16 giugno, p. 602.
CORINI (F.). — Sul **coefficiente di ricupero** nella trazione elettrica. (3 000 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1934 **625 .1 (.45)**
Rivista tecnica delle ferrovie italiane, Nº 5, 15 maggio, p. 242.
GOTELLI (R.) & REPETTI (E.). — **Raddoppio del binario** sul tronco Pieve Ligure-Camogli. (Linea Genova — La Spezia). (4 900 parole & fig.)

1934 **621 .335 (.45)**
Rivista tecnica delle ferrovie italiane, Nº 5, 15 maggio, p. 256.
BIANCHI (G.). — La **unificazione delle locomotive elettriche a corrente continua a 3 000 volt.** (15 700 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **69**
De Ingenieur, Nº 23, 1 Juni, p. Bt. 45.
DIBBITS (H. A. M. C.). — Eenige beschouwingen over **trilbeton,** naar aanleiding van de toepassing daarvan in Nederland. (7 800 woorden & fig.)

1934 **62. (0**
De Ingenieur, Nº 24, 15 Juni, p. A. 223.
KIST (N. C.). — **Toelaatbare spanningen in gedrukte staven.** (5 900 woorden & fig.)

1934 **62. (01 & 621 .11**
De Ingenieur, Nº 24, 15 Juni, p. E. 93.
Röntgenonderzoek van een gelaschten ketel. (4 500 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1934 **385 .517.6 (.492)**
Spoor en Tramwegen, Nr. 11, 22 Mei, p. 273.
BODEMEYER (Ch. F. P.). — Invoering van een **geneeskundigen dienst** bij de Nederlandsche Spoorwegen. (1 900 woorden.)

1934 **656 .253 (.42)**
Spoor en Tramwegen, Nr. 11, 22 Mei, p. 275.
VERSTEGEN (H.). — Iets over **dag- en nachtlichtseinen** naar aanleiding van een geval van toepassing nabij Londen. (2 400 woorden.)

1934 **621 .33 (.492)**
Spoor en Tramwegen, Nr. 12, 5 Juni, p. 297; Nr. 13, 19 Juni, p. 335.
PLOMP (A.). — **Electrificatie Rotterdam-Dordrecht. De bouwtechnische werkzaamheden.** (5 200 woorden & fig.)

1934 **625 .14 (.92)**
Spoor en Tramwegen, Nr. 12, 5 Juni, p. 307.
DE WIT (A. N. P.). — **De bovenbouwberekeningswijze van de Staatsspoor- en Tramwegen in Nederlandsch-Indië.** (2 000 woorden & fig.)

1934 **621 .43 (.492)**
Spoor en Tramwegen, Nr. 13, 19 Juni, p. 323.
LABRIJN (P.). — **Nieuwe locomotoren,** Nos 201-202 voor de Nederlandsche Spoorwegen. (2 000 woorden & fig.)

1934 **656 (.43)**
Spoor en Tramwegen, Nr. 13, 19 Juni, p. 341.
Duitsche verkeerspolitiek van dezen dag. (2 200 woorden & fig.) (Slot volgt.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1934 **621 .132.8 & 621 .43**

Gazeta dos caminhos de ferro, No 1114, 16 de maio, p. 277.

COLAÇO (L. F.).— **Novo modo de tracção ferroviária.** (1 300 palavras.)

1934 **385 .4 (.469)**

Gazeta dos caminhos de ferro, No 1115, 1 de junho, p. 287.

SOUSA (J. F. de). — **Estudos ácerca dos Caminhos de ferro do Estado.** (1 400 palavras.)

1934 **385 .113 (.469)**

Gazeta dos caminhos de ferro, No 1116, 16 de junho, p. 303.

SOUSA (J. F. de). — **A Companhia dos Caminhos de Ferro da Beira Alta em 1933.** (1 200 palavras.)

Revista das Estradas de ferro. (Rio de Janeiro.)

1934 **656 .1 & 656 .2**

Revista das Estradas de ferro, No 211, 30 de abril, p. 457.

ALBUQUERQUE (P. E.). — **Concorrencias das rodovias ás estradas de ferro.** (1 900 palavras.)

1934 **656 .1 & 656 .2**

Revista das Estradas de ferro, No 211, 30 de abril, p. 462.

SEIXAS (E.). — **As estradas de rodagem são cooperadoras das estradas de ferro e não rivaes.** (2 100 palavras.)

CORRIGENDUM.

Monthly Bibliography — June 1934, **Bulletin** : Pages 89 and 90 :

1934 **62. (03**

SCHLOMANN (A.). — **Dictionnaires techniques illustrés en six langues : français, allemand, anglais, espagnol, italien et russe.**

This notice is only intended to show the new prices of the Schlomann technical dictionaries; no new edition has been published and the date [1934] should be deleted.

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

SEPTEMBER (1934)

016. 385. (02]

I. — BOOKS.

In French.

1934 **385 (.44)**

nnuaire des chemins de fer, des tramways et des rices publics automobiles.

aris, Les Chemins de fer et les Tramways, 92, rue Lazare. 1 volume (16 × 24), 2 500 pages. (Prix : francs français.)

.934 **62. (01 & 669 .1**

ZAUD (R.).

echerches sur la fatigue des aciers.

aris, Blondel La Rougery & Gauthier-Villars. 1 vo-ie, 160 pages et 101 figures. (Prix : 30 francs fran-s.)

1934 **62. (01 & 669**

JEAN (P.) & GERSZONOWICZ (S.).

tat actuel de l'essai de fragilité des métaux.

aris (VIe), Dunod, 92, rue Bonaparte. 1 volume × 25), 103 pages et 61 figures. (Prix : 20 francs ançais.)

934 **624 (06**

Iémoires de l'Association internationale des Ponts et rpentes. Tome II.

urich, Leemann Frères, 64, Stockerstrasse. 1 volume, pages et 367 figures. (Prix : 34.80 francs suisses.)

1934 **665 .882**

CTTE (M.).

ilatation et retrait en soudure autogène.

aris (XVIIIe), Office Central de l'Acétylène et de Soudure autogène, 32, boulevard de la Chapelle. ix : 12 francs français.)

1934 **624 .2**

ERENDEEL (A.).

ours de stabilité des constructions (Complément du e IV). — **Calcul des poutres Vierendeel.**

ouvain, Librairie Universelle Uystpruyst, 10, rue de Monnaie, 1 brochure (20 × 27), 6 pages, 4 planches 8 figures. (Prix : 10 francs belges.)

In German.

1934 **624**

MITTASCH (W.) & BRAUNIG (K.).

Bau und Berechnung von Brücken.

Leipzig und Berlin, Teubner, B. G. 1 Band, 299 Seiten, 24 Tafeln und 650 Abbildungen. (Preis : 18 R.M.)

1934 **669 .1**

MÜLLER (H.).

Ein Beitrag zum Problem der Stahlhärtung.

München und Leipzig, Fritz und Joseph Vogerieder. 1 Band, 66 Seiten und 81 Schliffbildern. (Preis : 4.50 R.M.)

1934 **665 .882**

Sammelwerk der Autogen-Schweissung. Band 4 : Schweissen der Nichteisenmetalle.

Halle/Saale, Internationalen Beratungsstelle für Karbid und Schweisstechnik. 1 Band, 80 Seiten und Abbildungen. (Preis : 6 R.M.)

1934 **385 .4 (.436)**

SOLVIS (S.).

Der Weg zur Neuordnung der Österreichischen Bundesbahnen.

Wien, Julius Springer. 1 Band, 80 Seiten. (Preis : 2.70 R.M.)

In English.

1934 **621 .392**

BARDTKE (P.), Professor.

Technique of modern welding. Authorised English translation from the second German edition, with additional matter by the author, by Harold KENNEY, B. A.

London, Blackie and Son, Ltd. (Price : 15 sh. net.)

1934 **621 .116 & 621 .133.7**

BLANNING (H. K.) & RICH (A. D.).

Boiler feed and boiler water softening.

156 pages, charts, tables. (Price : $ 3.00.)

Chicago, Nickerson & Collins Co. (9 × 11 inches),

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress jointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 1509).

1934 0

FREEMAN (Henry).

Dictionary for metallurgists. (Ferrous and non-ferrous metallurgy). Part II : **English-German.**

Leipzig, Otto Spamer Verlag G. m. b. H. (Price : 25 marks.)

1934 621 .39

IBBETSON (W. S.).

Accumulator charging, maintenance and repair.

London, Sir Isaac Pitman & Sons, Ltd. Fourth edition. (Price : 3 sh. 6 d. net.)

1934 624 (06, 69 (06 & 72 (06

International Association for Bridge and Structural Engineering. — Publications. — **Vol. II.** The papers are printed in English, French or German with summaries in all three languages.

Zurich, Switzerland. Published by A. G. Gebr. Leeman & Co. (7 × 10 inches), 495 pages. (Price : 34.80 Swiss francs.)

1934 385. (07 (.42)

LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE (University of London).

Programme of lectures and classes on railway and cognate subjects. Session 1934-1935.

London, W.C. 2, London School of Economics and Political Science, Houghton Street, Aldwych, 1 pamphlet, 28 pages.

1934 387. (07 (.42)

LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE (University of London).

Summary programme, Session 1934-1935.

London, W.C. 2, London School of Economics and Political Science, Houghton Street, Aldwych, 1 pamphlet, 64 pages. (Price : 6 d.)

1934 621 .135 (01 & 625 .3

ROSS (J. F. S.)

Gyroscopic stabilization of land vehicles.

London, Edward Arnold & Co., New York, Longmans, Green & Co. (6 × 9 inches), 172 pages, diagrams, charts. (Price : $ 5.25.)

1934 38 (09 (.

SHERRINGTON (C. E. R.).

A hundred years of inland transport.

London, W.C. 2. Gerald Duckworth & Co. Ltd., Henrietta Street, 376 pages. (Price : 15 sh. net.)

1934 385

Universal Directory of Railway Officials and Railv Year Book, 1934-1935.

London, S.W. 1, The Directory Publishing Co. L 33, Tothill Street (8 1/2 × 5 1/2 inches), 577 pag (Price : 20 sh. net.)

In Spanish.

1934 656. (.4

ASOCIACION GENERAL DE TRANSPORTES P VIA FERREA.

Resumen de los trabajos de la Comisión para el Es dio de un Proyecto de Ordenación Ferroviaria y Transportes por Carretera.

I. — Decreto de convocatoria cuestionario y propu tas de la ponencia segunda (soluciones urgentes).

II. — Definición jurídica de la relación entre el Est do y las Compañías y sus consecuencias económicas.

III. — Régimen administrativo y fiscal de los tra portes por carretera y su coordinación con los tra portes por ferrocarril. (Dictamen de la Comisión.)

IV. — Escrito final de la representación de las Co pañías con referencia al conjunto de la labor desar lada por la Comisión.

Madrid, publicados por la dicha Asociación, Calle Prado, 26. 4 librejos, respectivamente de 46, 86, y 23 páginas.

1934 385. (01 (.4

El ferrocarril de Madrid a Burgos por Somosierra.

Madrid, Asociación General de Transportes por Férrea, Calle del Prado, 26. 1 volumen, 71 página

---

1934 721

KÖGLER (F.).

Cálculo de arcos. (Traducción española).

Barcelona, Labor, S. A. 1 volumen, 117 páginas. tablas y 29 figuras. (Precio : 9 pesetas.)

[016. 385. (05]

II. — PERIODICALS.

In French.

Annales des chemins de fer et tramways. (Paris.)

1934 656 .1 (.44) & 656 .2 (.44)

Annales des chemins de fer et tramways, mai-juin, p. 73.

La coordination des transports par fer et par route et la jurisprudence. (13 800 mots.)

Bulletin de la Société des ingénieurs civils de France. (Paris.)

1934 624. (0 &

Bull. de la Soc. des ing. civ. de France, nos 1 et janvier-février, p. 42.

LOSSIER (H.). — **L'avenir du béton armé et** métal pour les **ponts de très grande portée.** (10 mots & fig.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1934 **347 .762**

ull. des transp. intern. par ch. de fer, juillet, p. 346.
MALTESE (S.). — La **négociabilité des documents** è **transport** par chemin de fer. (5 500 mots.)

1934 **313 .385 (.91.882)**

ull. des transp. intern. par ch. de fer, juillet, p. 387.
Les **Chemins de fer** du Royaume yougoslave pendant exercice 1932. (1 200 mots.)

Chronique des transports. (Paris.)

1934 **656 (.44)**

hronique des transports, no 12, 25 juin, p. 1.
Le **Conseil National Economique** et la navigation ıtérieure. (7 500 mots.)

1934 **385 .113 (.44)**

hronique des transports, no 12, 25 juin, p. 10.
La Compagnie des **Chemins de fer du Nord.** (4 600 ots.)

1934 **656 .231 (.44)**

hronique des transports, no 13, 10 juillet, p. 3.
La **tarification** des chemins de fer français. (7 200 ots.)

Génie civil. (Paris.)

1934 **691**

énie civil, no 2707, 30 juin, p. 584.
DUMOLARD (P.). — Les **ciments** inattaquables par s eaux très pures. (4 200 mots.)

1934 **691**

énie civil, no 2707, 30 juin, p. 592.
BERGER (E.). — Les **mortiers** aqueux obtenus avec es liants organiques. (800 mots.)

1934 **621 .43**

énie civil, no 2708, 7 juillet, p. 13.
DELANGHE (G.). — Les **locomotives Diesel** à transission directe. (4 600 mots & fig.)

1934 **621 .132.8 (.44) & 621 .43 (.44)**

énie civil, no 2708, 7 juillet, p. 18.
L'automotrice rapide Bugatti de la Compagnie des hemins de fer de Paris à Lyon et à la Méditerranée. 1 700 mots & fig.)

1934 **385. (01 (.67)**

énie civil, no 2709, 14 juillet, p. 29.
HEGELBACHER (M.). — Le **chemin de fer Congo**-céan et les travaux du port de Pointe-Noire. (5 000 ots & fig.)

1934 **62. (01 & 691**

énie civil, no 2709, 14 juillet, p. 37 et no 2710, 21 juillet, p. 60.
Etude des effets de la température sur les ciments la Building Research Station de Garston (Angleerre) (5 900 mots & fig.)

1934 **62. (01 & 669 .1**

Génie civil, no 2710, 21 juillet, p. 65.
L'examen des pièces métalliques par les rayons X et par les rayons gamma. (1 800 mots & fig.)

1934 **656 (.43)**

Génie civil, no 2710, 21 juillet, p. 66.
Le nouvel **avion postal « Dornier Do. F. » des Chemins de fer allemands.** (1 000 mots & fig.)

L'Allègement dans les Transports. (Lucerne.)

1934 **625 .2 (0**

L'Allègement dans les Transports, nos 5-6, mai-juin, p. 59.
GILARDI (U.). — De **l'allègement du matériel roulant** par l'emploi de métaux spéciaux. (3 000 mots, 4 tableaux & fig.) (A suivre.)

La Traction électrique. (Paris.)

1934 **621 .335 & 621 .43**

La Traction Electrique, février, p. 24.
MÜLLER (A. E.). — Considérations sur la **traction Diesel-électrique.** (1 400 mots & fig.) (Fin.)

1934 **621 .337**

La Traction Electrique, février, p. 31, et mars, p. 41.
HUG (A. M.). — La **commande individuelle des essieux;** des systèmes utilisés pour locomotives et motrices dans l'exploitation des voies ferrées de toute nature. (3 300 mots & fig.)

1934 **388 (.437) & 625 .4 (.437)**

La Traction Electrique, mars, p. 54.
POKORNY (J.). — Concours pour le **programme général des transports** et projet de métropolitain à Prague. (1 500 mots & fig.)

1934 **621 .33 (.494)**

La Traction Electrique, avril, p. 59.
DUERLER (W.). — Dix ans d'**exploitation électrique** du réseau entier des chemins de fer rhétiques. (12 700 mots, 2 tableaux & fig.)

Les Chemins de fer et les Tramways. (Paris.)

1934 **621 .132.3 (.42)**

Les Chemins de fer et les Tramways, juillet, p. 158.
SPIESS (E.). — **Locomotive à trois cylindres, type 1-4-1** du London & North Eastern Railway. (4 600 mots & fig.)

1934 **621 .43**

Les Chemins de fer et les Tramways, juillet, p. 161.
Transmissions électriques pour locomotives Diesel-électriques. (4 800 mots & fig.)

1934 **621 .138.2**

Les Chemins de fer et les Tramways, juillet, p. 165.
VIÉ (G.). — **Organisation des dépôts de machines.** Manutention mécanique des combustibles et scories. (3 000 mots & fig.)

1934 **625 .116**

Les Chemins de fer et les Tramways, juillet, p. 167.

DESGARDES (E.). — **Attelage automatique** pour petit matériel. (2 000 mots & fig.)

1934 **621 .133.7 (.44)**

Les Chemins de fer et les Tramways, juillet, p. 170.

Pompe réchauffeur d'eau d'alimentation. (1 200 mots & fig.)

1934 **625 .13 (.44)**

Les Chemins de fer et les Tramways, juillet, p. 172.

CHARRIN (V.). — Creusement du **tunnel** du Mont-du-Chat. (1 000 mots & fig.)

1934 **656 .211 (.44) & 656 .212 (.44)**

Les Chemins de fer et les Tramways, juillet, p. 174.

DUQUESNOY. — La **reconstruction de la gare** de Chartres. (2 400 mots & fig.)

1934 **625 .3 (.44)**

Les Chemins de fer et les Tramways, juillet, p. 176.

VIÉ (G.). — Les **lignes transpyrénéennes.** (5 100 mots & fig.)

1934 **625 .142.3**

Les Chemins de fer et les Tramways, juillet, p. 180.

Traverses métalliques assemblées. (1 300 mots & fig.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1934 **656 .1 & 656 .2**

L'Ind. des voies ferrées et des transp. automob., juin, p. 301.

GOSSART. — Avantages et inconvénients résultant de la **substitution des transports automobiles sur routes aux services de la voie ferrée** assurant le transport des voyageurs lorsque cette voie doit être maintenue pour le transport des marchandises. (3 300 mots.)

1934 **625 .611**

L'Ind. des voies ferrées et des transp. automob., juin, p. 305.

ROQUEMAUREL (de). — Etude des principales **économies pouvant être réalisées sur les chemins de fer d'intérêt local** (Traction — Voie — Exploitation). (7 700 mots.)

1934 **625 .14 (.44)**

L'Ind. des voies ferrées et des transp. automob., juin, p. 313.

Nouveau système de pose de voie sur traverses métalliques légères assemblées, en service sur le réseau de l'Est de Lyon. (1 400 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1934 **721 .9 (.493)**

L'Ossature métallique, juin, p. 279.

BAES (L.). — Les **grands palais** de l'Exposition Universelle et Internationale de Bruxelles 1935. (4 800 mots & fig.)

1934 **621 .43 (.493)**

L'Ossature métallique, juin, p. 298.

La nouvelle **automotrice jumelée Diesel-électriqu** 410 HP de la Société Nationale des chemins de fe belges. (1 300 mots & fig.)

1934 **62. (0**

L'Ossature métallique, juin, p. 305.

BAES (L.). — Les principes de la plasticité parfait appliqués aux **calculs de résistance des matériaux.** (1 00 mots & fig.)

Rail et route. (Paris.)

1934 **656 (.44**

Rail et route, juin, p. 26.

Coordination des transports : Première applicatio régionale. Les accords de Rouen. (9 000 mots.)

Revue de l'Ecole polytechnique. (Bruxelles.)

1934 **625 .173 & 656 .222.**

Revue de l'Ecole polytechnique, mars, p. 267.

DEVOOGHT (R.). — Note sur un monogramme points alignés déterminant le **retard provoqué au** trains par les travaux de la voie. (1 900 mots & fig.

Revue générale des chemins de fer. (Paris.)

1934 **625 .258 (.44**

Revue générale des chemins de fer, juillet, p. 3.

NOUET. — Amélioration de l'emploi des **sabot d'enrayage** dans les gares de triage du Réseau du Nor (5 700 mots & fig.)

1934 **385. (09 (.64**

Revue générale des chemins de fer, juillet, p. 17.

Les **chemins de fer** marocains. (17 000 mots & fig.)

Revue politique et parlementaire. (Paris.)

1934 **385 .4 (.44), 656 .1 (.44) & 656 .2 (.44**

Revue politique et parlementaire, 10 juillet, p. 24.

PESCHAUD (M.). — La **restauration des chemins d** fer et la coordination des transports. (16 000 mots.)

Revue universelle des Mines. (Liége.)

1934 **669**

Revue universelle des mines, n° 13, 1er juillet, p. 341.

KERSTEN (P.). — Contribution à l'étude des ph nomènes d'hérédité morphologique dans les **aciers h** poeutectoïdes. (4 800 mots & fig.) (A suivre.)

In German.

Die Lokomotive. (Wien).

1934 **621 .132.5 (.44**

Die Lokomotive, Juli, S. 117.

1D und 1E Vierzylinder-Verbund-Heissdampf-Güte lokomotive der französischen Nordbahn. (3 800 Wört & Abb.)

1934 621 .33 (.436)
Lokomotive, Juli, S. 123.
Die Electrisierung der Österreichischen Bundesbahnen.
0 Wörter.)

Elektrische Bahnen. (Berlin.)

1934 621 .333
ktrische Bahnen, Juni, S. 121.
MICHEL (O.). — Internationale Regeln für Fahrgmotoren. (5 300 Wörter, 5 Tafeln & Abb.)

1934 621 .33
ktrische Bahnen, Juni, S. 133.
VOGEL (Th.). — Arbeitsorganisation und Zeitaufnme der Kettenwerksmontage bei der Elektrisierung eigleisiger Bahnen. (6 700 Wörter & Abb.) (Fortzung folgt.)

1934 385 .59
ktrische Bahnen, Juni, S. 141.
KOTHER (H.). — Über die Möglichkeiten selbsttäer Wirkungsgrad-, Leistungs- und Arbeitsmessuni mit besonderer Berücksichtigung ortsfester und rbarer Maschinen des Eisenbahnbetriebes (D. R. P. gemeldet). (2 000 Wörter, 2 Tafeln & Abb.)

Glasers Annalen. (Berlin.)

1934 621 .131.1
sers Annalen, Heft 12, 15. Juni, S. 93.
VELTE. — Über Bezugswerte im Lokomotivfahrnst und ihre Verwendungsmöglichkeit zur Prüfung Wirtschaftlichkeit. (1 500 Wörter & Abb.)

1934 385 .13 (.43)
sers Annalen, Heft 12, 15. Juni, S. 95.
Aus dem Geschäftsbericht der Deutschen Reichsbahnsellschaft über das 9. Geschäftsjahr. (5 000 Wörter Abb.)

1934 625 .2 (0
sers Annalen, Heft 1, 1. Juli, S. 1.
NEESEN. — Die Schwerpunktlage bei Eisenbahn d Kraftfahrzeug. (2 700 Wörter & Abb.)

1934 625 .143.2
sers Annalen, Heft 1, 1. Juli, S. 5.
THEOBALD. — Schienen mit harter Fahrfläche. 100 Wörter.)

gan für die Fortschritte des Eisenbahnwesens. (Berlin.)

1934 625 .251
gan für die Fortschritte des Eisenbahnwesens, Heft 13, 1. Juli, S. 247.
METZKOW. — Untersuchung der Haftungsverhältse zwischen Rad und Schiene beim Bremsvorgang. 200 Wörter & Abb.)

1934 625 .142.2
Organ für die Fortschritte des Eisenbahnwesens, Heft 14, 15. Juli, S. 40.
PIRATH (C.). — Die Verarbeitung der Kraftangriffe in hölzernen Eisenbahnschwellen. (8 000 Wörter & Abb.)

1934 625 .14 (01
Organ für die Fortschritte des Eisenbahnwesens, Heft 14, 15. Juli, S. 272.
SALLER. — Zur Dynamik des Eisenbahnoberbaues. (700 Wörter & Abb.)

1934 656 .221
Organ für die Fortschritte des Eisenbahnwesens, Heft 14, 15 Juli, S. 273.
LANGE (A.). — Das Anziehen von Eisenbahnwagen. (1 900 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 625 .244 (.43)
Zeitsch. des Ver. deutsch. Ing., Nr. 26, 30. Juni, S. 805.
Kühlwagen für lange Strecken. (300 Wörter & Abb.)

1934 625 .212
Zeitsch. des Ver. deutsch. Ing., Nr. 27, 7. Juli, S. 823.
THUM (A.) & WUNDERLICH (F.). — Zur Festigkeitsberechnung von Fahrzeugachsen. (2 200 Wörter & Abb.)

1934 621 .133.3 (.43)
Zeitsch. des Ver. deutsch. Ing., Nr. 27, 7. Juli, S. 829.
MECKEL (A.). — Die neuen Rohrleitungsnormen des Lokomotivbaues. (1 800 Wörter & Abb.)

1934 621
Zeitsch. des Ver. deutsch. Ing., Nr. 27, 7. Juli, S. 831.
SCHLAEFKE (K.). — Bewegungsverhältnisse von Kurbelgetrieben mit Nebenpleuelstangen. (2 100 Wörter & Abb.)

1934 625 .143.2
Zeitsch. des Ver. deutsch. Ing., Nr. 29, 21. Juli, S. 893.
KÜHNEL (R.). — Untersuchungen an hochwertigen Schienen. (400 Wörter.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 656 .253 (.43) & 656 .256 (.43)
Zeitsch. für das gesamte Eisenb.-Sicherungsw., Nr. 9, 10. Juli, S. 109.
VOIGT. — Sicherungsanlagen für zweigleisigen und zeitweise eingleisigen Betrieb. (1 500 Wörter & Abb.)

Zeitung des Vereins Mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 656 .211.7 (.43 + .485)
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 27, 5. Juli, S. 473.
FLUME (R.). — 25 Jahre Eisenbahn-Fährverbindung Sassnitz-Trälleborg. (3 900 Wörter & Abb.)

1934 **621 .132.8 (.73) & 621 .43 (.73)**
Zeitung des Vereins Mitteleurop. Eisenbahnverw. Nr. 28, 12. Juli, S. 489.
WITTE (Fr.). — Die **Betriebsmittel im Schnellverkehr** der Eisenbahnen der Vereinigten Staaten von Amerika. (2 400 Wörter & Abb.)

1934 **625 .216 (.4)**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 29, 19. Juli, S. 505.
ZEHNDER (R.). — Der gegenwärtige Stand der Frage der **automatischen Kupplung** der Fahrzeuge der Eisenbahnen in Europa. (5 600 Wörter.)

In English.

Engineer. (London.)

1934 **621 .134.1**
Engineer, No. 4094, June 29, p. 646.
BAXTER (F. L.). — **Locomotive crank axles.** (3 000 words, 3 tables & fig.)

1934
Engineer, No. 4094, June 29, p. 650.
The International Steel Congress, London, June 1934. (4 400 words.)

1934 **621 .392**
Engineer, No. 4094, June 29, p. 652.
DIGBY (W. P.). — The human factor in **arc welding.** (3 000 words & fig.)

1934 **38**
Engineer, No. 4094, June 29, p. 661.
LAMBERT (C. A.). — The **transport requirements of industry.** (1 800 words.)

1934 **621 .43 (.42)**
Engineer, No. 4094, June 29. No. 662.
Express railcars for the G. W. Ry. (900 words & fig.)

1934 **621 .31 (.42)**
Engineer, No. 4095, July, 6, p. 3.
Engineer, No. 4096, July 13, p. 41.
The Grampian **hydro-electric power scheme : Tummel development.** (4 500 words & fig.)

1934 **621 .131.3 (.42) & 621 .132.3 (.42)**
Engineer, No. 4095, July 6, p. 16.
Dynamometer tests of « Cock o' the North ». (1 200 words & fig.)

1934 **621 .5**
Engineer, No. 4095, July 6, p. 19.
A railway self-propelled compressor plant. (200 words & fig.)

1934 **625 .13 (.42)**
Engineer, No. 4095, July 6, p. 26.
The **Mersey tunnel.** — No. I. (4 800 words & fig.)

1934 **625 .13 (.**
Engineer, No. 4097, July 20, p. 52.
The **Mersey tunnel, No. II.** (4 300 words, tables & fi

1934 **621 .43 (.**
Engineer, No. 4097, July, 20, p. 62.
Railcars for South Africa. (700 words & fig.)

1934 **62 (01 & 6**
The Metallurgist, p. 131, Supplt. to the Engin June 29.
The **corrosion action of brines.** (1 000 words & f

1934 **62 (01 & 66**
The Metallurgist, p. 134, Supplt. to the Engin June 29.
HARRISON (R.). — **The age-hardening of ste** Communication from the Research Department, W wich. (1 500 words, 13 tables & fig.)

Engineering. (London.)

1934 **621 .31 (.**
Engineering, No. 3572, June 29, p. 719.
The Brimsdown **generating station** of the North tropolitan **Electric Power Supply** Company. (4 words & fig.)

1934 **669 .1 (06 (.**
Engineering, No. 3572, June 29, p. 721.
The Iron and Steel Institute. — **Ingot structures,** Dr. L. NORTHCOTT. — **Thermal conductivity of steels,** by Dr. HATTORI. (2 300 words.)

1934 **621 .**
Engineering, No. 3572, June 29, p. 722.
JOSSE (E.). — **Loeffler boiler tests.** (4 000 wo 9 tables & fig.)

1934 **669 .1**
Engineering, No. 3572, June 29, p. 726.
International Congress for steel development, I don, June 20-23, 1934. (3 000 words.)

1934 **621**
Engineering, No. 3573, July 6, p. 1.
50 000-kw. Ljungström **turbo-generator** for the teras Power Station, Sweden. (4 200 words & fig.)

1934 **624 (0 (.73) & 624 .51 (.**
Engineering, No. 3573, July 6, p. 4.
Model tests for the San Francisco-Oakland bri (3 400 words, 1 table & fig.)

1934 **621 .131.3 (.42) & 621 .132.3 (.**
Engineering, No. 3573, July 6, p. 20.
Test of 2-8-2 type locomotive No. 2001, Londo North Eastern Ry. (1 000 words.)

1934 **621 .33 (.45) & 625 .1 (.**
Engineering, No. 3574, July 13, p. 29.
The Bologna-Florence « direttissima ». (2 700 w & fig.)

1934 **625 .13 (.42)**
ineering, No. 3574, July 13, p. 37.
ir-flow meters for the Mersey tunnel. (1 000 words
ig.)

1934 **621 .33 (.81)**
ineer, No. 3574, July 13, p. 45.
ailway electrification in Brazil. (500 words.)

Engineering News-Record. (New York.)

1934 **624 .32 (.73)**
ineering News-Record, No. 26, June 28, p. 841.
EPPESEN (G.). — Illinois bridge reflects careful
ly of details. (1 500 words & fig.)

1934 **624. (0**
ineering News-Record, No. 26, June 28, p. 843.
lodels as aids in design and construction. (5 000
ds.)

1934 **624 .8 (.73)**
ineering News-Record, No. 1, July 5, p. 1.
hicoutini swing span requires huge protection pier.
00 words & fig.)

1934 **625 .7 (.43), 656 .1 (.43) & 656 .2 (.43)**
ineering News-Record, No. 1, July 5, p. 10.
EHNER (B.). — Germany begins construction of
ress highway system. (3 000 words & fig.)

1934 **665 .882**
ineering News-Record, No. 1, July 5, p. 12.
xy-acetylene cutting of structural steel. — Recom-
nded practices applicable to the use of the cutting
wpipes in fabricating shops and in the field. (3 000
ds & fig.)

1934 **62. (01 (06 (.73)**
ineering News-Record, No. 1, July 5, p. 18, and
No. 2, July 12, p. 51.
pecifications and tests reviewed by A. S. T. M.
00 words.)

1934 **62. (01 & 693**
ineering News-Record, No. 2, July 12, p. 35.
REEN (N. B.) & HORNER (A. C.). — Joists an-
rs in masonry walls tested for earthquake resist-
e. (2 800 words, 2 tables & fig.)

Great Western Railway Magazine. (London.)

1934 **621 .43 (.42)**
eat Western Ry. Magazine, July, p. 307.
reat Western Ry. stream-lined rail cars for through
press services. (2 500 words & fig.)

Journal, Institute of Transport. (London.)

1934 **38 & 656**
rnal, Institute of Transport, July, p. 399.
AMBERT (C. A.). — The transport requirements of
lustry. (12 000 words.)

1934 **656 (.42)**
Journal, Institute of Transport, July, p. 415.
FENELON (K. G.). — The public control of passen-
ger transport outside London. (12 000 words.)

1934 **656**
Journal, Institute of Transport, July, p. 432.
JONES (J. H.). — The price issue in public utility
and monopolistic industries. (11 300 words.)

Mechanical Engineering. (New York.)

1934 **621 .2 (.73)**
Mechanical Engineering, July, p. 387.
KINZIE (P. O.). — Hydraulic valves and gates for
Boulder Dam. — Part I. — The design and fabrication
of the cylinder gates and operating mechanism. (10 000
words & fig.)

1934 **621 .31 (.73)**
Mechanical Engineering, July, p. 409.
McClellan (L. N.). — Boulder Dam generators. —
The mechanical features of the largest hydro-electric
power plant generators in the world. (4 200 words &
fig.)

1934 **621 .24 (.73)**
Mechanical Engineering, July, p. 415.
WINTER (I. A.). — Turbines for Boulder Dam. —
Mechanical features of the largest hydraulic turbines
in the world. (9 500 words & fig.)

1934 **62. (01**
Mechanical Engineering, July, p. 428.
Strength of materials : Corrosion stress as cause of
rupture. — Computation of the strength of turbine
blades. — Long-range ruptures in moving parts of high-
speed Diesel engines. — Crankshafts. — Connecting-
rod bolts. — Material for steam boilers. (3 000 words.)

Modern Transport. (London.)

1934 **625 .232 (.41)**
Modern Transport, No. 798, June 30, p. 5.
Accelerated rail service in Northern Ireland. (1 000
words & fig.)

1934 **621 .43 (.41)**
Modern Transport, No. 798, June 30, p. 6.
Diesel railcars in Ireland. (900 words & fig.)

1934 **625 .232 (.42)**
Modern Transport, No. 799, July 7, p. 3.
New buffet cars for the G. W. Ry. (1 500 words &
fig.)

1934 **656 .1 (.43) & 656 .261 (.43)**
Modern Transport, No. 799, July 7, p. 5.
Transporting rail vehicles by road. (1 100 words &
fig.)

1934 **656 .23 (.42)**
Modern Transport, No. 799, July 7, p. 6.
Railways Act and price fluctuations. (2 300 words.)

1934 **385 .1 (.54)**
Modern Transport, No. 799, July 7, p. 7.
Railways in India. — Promotion of **efficiency** and **economy.** (2 300 words.)

1934 **625 .13 (.42)**
Modern Transport, No. 800, July 14, p. 3.
Completion of the **Mersey tunnel.** (2 700 words & fig.)

1934 **385**
Modern Transport, No. 800, July 14, p. 5.
NEWLANDS (A.). — **The railway highway.** — A review of changing conditions. (Abstract of a paper read at the Jubilee convention of the **Permanent way Institution,** London, July 7. (1 900 words.)

1934 **621 .43 (.42)**
Modern Transport, No. 800, July 14, p. 6.
Railcars for main line services. — G. W. R. experiment. (800 words & fig.)

1934 **656 .28 (01 (.42)**
Modern Transport, No. 801, July 21, p. 3.
Railway accidents in Great Britain. — Lowest number killed for thirty years. (2 000 words.)

1934 **625 .4 (.73)**
Modern Transport, No. 801, July 21, p. 4.
Railway development in New York. — **Overhead goods line to eliminate level crossings.** (3 100 words & fig.)

1934 **347 .763 (.42)**
Modern Transport. No. 801. July 21. p. 6.
Road-Rail Traffic Act. — **Wages and drivers' hours.** (1 100 words.)

1934 **336 .2 (.42) & 656 .1 (.42)**
Modern Transport, No. 801, July 21, p. 7.
Motor legislation and taxation. — **An interesting chronology.** (1 800 words.)

1934 **621 .338 (.73)**
Modern Transport, No. 801, July 21, p. 8.
Aluminium trains in New York. (350 words.)

Proceedings, Institution of Civil Engineers. (London.)

1932-1933 **621 .338 & 656 .222.1**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 1.
UNWIN (C. B.). — **Electric trains for services with frequent stops.** (7 800 words & fig.)

1932-1933 **621 .13, 621 .335 & 621 .43**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 23.
RICHARDS (H. W. H.). — Primary considerations relating to **steam, electric, and Diesel-electric traction.** (16 000 words & 38 tables.)

1932-1933 **621 .338**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 82.
BAKER (W. S. G.). — Some features of **design in electric rolling stock for intense service.** (6 200 words.)

1932-1933 **621**
Proceed., Institut. of Civil Engineers, Vol. 236, p.
Discussion and correspondence on **railway electri**cation. (36 000 words & 4 cuts.)

1932-1933 **62. (01 &**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 3
CHERRY (H. C. E.). — The **influence of earthqual** on structural design. (18 000 words & fig.)

1932-1933 **62. (01 &**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 3
FURKET (F. W.). — The **effect of earthquakes** engineering structures. (11 000 words & fig.)

1932-1933 **62. (01 &**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 3
BOOTH (J. J.). — The design of an **earthqual resisting structure :** the Dominion Museum, Wellingt N. Z. (5 200 words, fig. & 13 cuts.)

1932-1933 **62. (01 &**
Proceed., Institut. of Civil Engineers, Vol. 236, p. 3
Discussion and correspondence on the **effects** earthquakes. (23 000 words & 6 cuts.)

Railway Age. (New York.)

1934 **621 .13 (0 & 621 .13**
Railway Age. No. 24. June 16, p. 864.
Economic life of steam locomotives and cost of pairs. (2 900 words, 3 tables & fig.)

1934 **624 .1 (.**
Railway Age, No. 24, June 16, p. 867.
Shear booms embody unique features. (1 800 wo & fig.)

1934 **347 .763 (.73) & 656 .1 (.**
Railway Age, No. 24, June 16, p. 871.
« Port of entry » law succesful. (1 500 words.)

1934 **621 .1 (.**
Railway Age, No. 25, June 23, p. 908.
New York Central completes **elevation of 2.3 m** of busy freight line in New York City. (5 900 wo & fig.)

1934 **625 .24**
Railway Age, No. 25, June 23, p. 915.
TURNEY (J. R.). — The **freight car of the fut** (3 900 words.)

1934 **656 .254 (06 (.**
Railway Age, No. 25, June 23, p. 918.
Telegraph and Telephone Section (A. R. A.), m in Chicago. (2 100 words.)

1934 **625 .243 (.**
Railway Age, No. 25, June 23, p. 925.
Box-car designs tested by A. R. A. (2 000 wo & fig.)

1934 656 .1 (.73)
Railway Age, No. 25, June 23, p. 928.
Co-ordination succeeds in West Virginia. — Baltimore & Ohio subsidiary co-operates with private coach lines. (1 300 words & fig.)

1934 347 .763 (.43) & 656 .1 (.43)
Railway Age, No. 25, June 23, p. 930.
Germany eliminates 'wild-cat' operators. — Strict regulation of highway motor carriers successfully stabilizes transportation industry. (1 300 words & fig.)

1934 656 .212 (.73) & 725 .32 (.73)
Railway Age, No. 26, June 30, p. 944.
Large freight station to be opened in New York. (3 500 words & fig.)

1934 656 .256.3 (.73)
Railway Age, No. 26, June 30, p. 955.
Signaling eliminates « bottle neck ». (1 200 words & fig.)

1934 621 .13 (0
Railway Age, No. 26, June 30, p. 959.
Ten years locomotive development inutilized. (1 500 words & fig.)

1934 625 .24 (0
Railway Age, No. 26, June 30, p. 961.
New materials change outlook for freight-car construction. (1 800 words & fig.)

1934 621 .43
Railway Age, No. 26, June 30, p. 963.
Developments in the use of Diesel power. (1 900 words & fig.)

1934 625 .235
Railway Age, No. 26, June 30, p. 965.
Style becomes a factor of importance in passenger-car design. (1 700 words & fig.)

1934 385. (061.4 (.73) & 385. (072 (.73)
Railway Age, No. 26, June 30, p. 967.
A. R. A., Mechanical Division, reports notable progress in research. (8 000 words, tables & fig.)

1934 621 .135.2 (.73)
Railway Age, No. 1, July 7, p. 4.
TAYLOR (B. W.). — Locomotive with roller bearings on main and side rods. (2 200 words & fig.)

1934 385 (06 (.73)
Railway Age, No. 1, July 7, p. 7.
American Association of Railroad Superintendents meet in Chicago. — Committee reports feature highway competition and faster freight service. (7 000 words.)

1934 656 .257 (.73)
Railway Age, No. 1, July 7, p. 13.
Automatic interlocking protects crossing of two main lines. (1 100 words & fig.)

1934 656 .257 (06 (.73)
Railway Age, No. 1, July 7, p. 15.
Freight accounting in spotlight at R. A. O. A. meeting. (7 800 words.)

1934 62. (01 (06 (.73)
Railway Age, No. 1, July 7, p. 21.
A. S. T. M. holds annual meeting. (2 000 words.)

1934 621 .132.3 (.42)
Railway Age, No. 1, July 7, p. 33.
POULTNEY (E. C.). — L. & N. E. Ry. three-cylinder express locomotive. (2 400 words, 1 table & fig.)

1934 389 (.73) & 621 .132.8 (.73)
Railway Age, No. 2, July 14, p. 36.
How accurate are your scales ? (3 000 words, tables & fig.)

1934 621 .139 (.73)
Railway Age, No. 2, July 14, p. 41.
SOWARBY (A. J.). — New York, Ontario & Western finds profit in studying material records. (3 000 words.)

Railway Engineer. (London.)

1934 621 .135.4
Railway Engineer, July, p. 205.
PORTER (the late S. R. M.). — The mechanics of a locomotive on curved track. (1 800 words & fig.)

1934 625 .144.4 & 625 .17
Railway Engineer, July, p. 207.
Mechanical permanent way maintenance. (2 600 words & fig.)

1934 625 .143.2, 625 .143.3 & 625 .143.4
Railway Engineer, July, p. 210.
Hardening rails. (500 words.)

1934 625 .144.4 (.73) & 625 .17 (.73)
Railway Engineer, July, p. 211.
PHILLIPS (G. A.). — Modern U. S. A. maintenance methods. (3 700 words & fig.)

1934 625 .14 (.54)
Railway Engineer, July, p. 215.
SIMS (A. M.). — Features of modern Indian permanent way. (3 000 words & fig.)

1934 625 .175
Railway Engineer, July, p. 217.
The motor trolley system of maintenance. — I. (2 000 words & fig.)

1934 625 .143
Railway Engineer, July, p. 220.
The steel rail. (2 600 words & fig.)

1934 625 .15
Railway Engineer, July, p. 223.
The manufacture of switches and crossings. (1 900 words & fig.)

1934 **625 .18 (.42)**
Railway Engineer, July, p. 226.
Salving permanent way material. (1 000 words & fig.)

1934 **625 .143.3**
Railway Engineer, July, p. 227.
Improvements in **rail fissure detection.** (1 000 words.)

1934 **625 .18**
Railway Engineer, July, p. 228.
Permanent way accounts.

1934 **625 .1 (06 (.42)**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 1.
Jubilee souvenir of the Permanent Way Institution. — **Foreword** by Arthur R. COOPER. (1 200 words.)

1934 **625. (093**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 6.
BLAND (F.). — **The genesis of permanent way.** (1 600 words & fig.)

1934 **656 .25 (093**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 9.
TATTERSALL (A. E.). — **Development of signalling.** (2 000 words & fig.)

1934 **385. (092 (.42)**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 12.
CARPMAEL (R.). — **Brunel — our inspiration.** (1 600 words & fig.)

1934 **385. (071 (.42)**
Jubilee souvenir of the Permanent Way Institution. Supplt. to the July 1934 issue of The Ry. Engineer, p. 15.
ELLSON (G.). — **The education of permanent way men.** (900 words & fig.)

1934 **385. (01**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 17.
SPILLER (J. W.). — **Colonial railways.** (1 600 words & fig.)

1934 **625 .1 (0 (.42)**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 27
WILLOX (W. A.). — **Recent tendencies in permanent way practice.** (1 600 words & fig.)

1934 **621 .13 & 625 .14**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 23.
ALLEN (C. J.). — **Locomotives and track.** (1 600 words & fig.)

1934 **625 .144.2 (.42)**
Jubilee souvenir of the Permanent Way Institution, Supplt. to the July 1934 issue of The Ry. Engineer, p. 25.
Cant chart (L. N. E. Ry.).

Railway Engineering and Maintenance. (Chicago.)

1934 **621 .43 (.73) & 656 .222.1 (.73)**
Railway Engineering & Maintenance, July, p. 368.
A thousand miles in thirteen hours. (2 800 words & fig.)

1934 **624 .1**
Railway Engineering & Maintenance, July, p. 372.
Internal grouting restores stone masonry piers. (1 700 words & fig.)

1934 **625 .144.4 (.73)**
Railway Engineering & Maintenance, July, p. 374.
Making track dustless. (3 200 words & fig.)

1934 **625 .143.4 & 656 .256**
Railway Engineering & Maintenance, July, p. 382.
Track circuits without bonds on the Missouri-Kansas-Texas Ry. (1 200 words & fig.)

Railway Gazette. (London.)

1934 **625 .234**
Railway Gazette, No. 26, June 29, p. 1136.
MIALL (S.). — **Air conditioning of trains** — I. (1 500 words & fig.)

1934 **385 .1 (.54)**
Railway Gazette, No. 26, June 29, p. 1138.
Second **report** of the Pope Economy Committee **upon Indian Railway.** (1 400 words.)

1934 **621 .43 (.43)**
Railway Gazette, No. 26, June 29, p. 1139.
A German « **One man** » **shunting motor.** (500 words & fig.)

1934 **621 .131.3 (.42) & 621 .132.3 (.42)**
Railway Gazette, No. 26, June 29, p. 1147.
Experimental run with the « Cock o' the North », L. N. E. Ry. (2 000 words.)

1934 **656 .222.1 (.42)**
Railway Gazette, No. 26, June 29, p. 1149.
High-speed running. (900 words & 2 tables.)

1934 **625 .1 (06 (.42) & 625 .175 (.42)**
Railway Gazette, No. 1, July 6, p. 11.
Saving £ 400 000 on the British Railways by the introduction of **petrol trolleys.** Report of Mr. R. Carpmael's remarks at the annual dinner of the Permanent Way Institution, January 28, 1933. (3 300 words & fig.)

1934 **625 .232 (.42)**
Railway Gazette, No. 1, July 6, p. 15.
New **buffet cars, Great Western Ry.** (1 000 words & fig.)

1934 **621 .43 (.42) & 625 .175 (.42)**
Railway Gazette, No. 1, July 6, p. 19.
Road-railer for permanent way work. (800 words & fig.)

1934 **625 .244 (.45) & 656 .1 (.45)**
Railway Gazette, No. 1, July 6, p. 22.
Refrigerator containers on the Italian State Railways. (1 300 words & fig.)

1934 **656 .1 (.42) & 656 .225 (.42)**
Railway Gazette, No. 1, July 6, p. 24.
Containers and strawberry traffic. (300 words & fig.)

1934 **656 .28 (01 (.42)**
Railway Gazette, No. 3, July 20, p. 99.
Colonel Mount's annual report. — (Railway accidents in Great Britain, 1933.) (1 600 words & 1 table.)

1934 **625 .144.4 (.42) & 625 .173 (.42)**
Railway Gazette, No. 3, July 20, p. 106.
Relaying with steam cranes. (700 words & fig.)

1934 **625 .172 (.42)**
Railway Gazette, No. 3, July 20, p. 107.
HEINZE (E. P. A.). — A German **track recorder.** (700 words & fig.)

1934 **625 .216**
Railway Gazette, No. 3, July 20, p. 109.
An improved **drawbar cradle for railway wagons.** (650 words & fig.)

1934 **725 .3 (.42)**
Railway Gazette, No. 3, July 20, p. 110.
An **architectural renaissance** on the L. N. E. Ry. (1 600 words & fig.)

1934 **625 .235 (.45)**
Railway Gazette, No. 3, July 20, p. 115.
Italian **wooden-bodied coaches converted to all-metal construction.** (200 words & fig.)

1934 **385. (09 (.51)**
Railway Gazette, No. 3, July 20, p. 119.
LING (H. H.). — **Completing the Canton Hankow Railway.** (3 200 words, 2 tables & fig.)

1934 **621 .43 (.43)**
Diesel Ry. Traction, p. 78, supplt. to The Ry. Gazette, July 13.
Railcars of the Reichsbahn. — I. (To be continued.) (2 000 words & fig.)

1934 **621 .335 (.44) & 621 .43 (.44)**
Diesel Ry. Traction, p. 82, supplt. to The Ry. Gazette, July 13.
Diesel-electric express on the Nord. (1 200 words & fig.)

1934 **621 .43**
Diesel Ry. Traction, p. 84, supplt. to The Ry. Gazette, July 13.
Lithuania adopts **Diesels.** (1 000 words & fig.)

1934 **621 .43 (.42)**
Diesel Ry. Traction, p. 86, supplt. to The Ry. Gazette, July 13.
British **express Diesel railcars.** (3 000 words & fig.)

1934 **621 .335 (.45)**
Electric Ry. Traction, p. 1162, supplt. to the Ry. Gazette, June 29.
BIANCHI (G.). — The **standardisation of high-tension D. C. locomotives** in Italy. (2 300 words & fig.)

1934 **621 .131.1 & 621 .335**
Electric Ry. Traction, p. 1168, supplt. to the Ry. Gazette, June 29.
WHYMAN (F.). — The **adhesion efficiency of electric locomotives when braking.** (1 000 words & fig.)

1934 **621 .331**
Electric Ry. Traction, p. 1170, supplt. to the Ry. Gazette, June 29.
Mercury arc rectifiers. — IV. Notes on the construction, application, and performance of the **glass-bulb type of rectifier as used in heavy railway traction** service. (4 000 words & fig.)

1934 **621 .33 (.81)**
Electric Ry. Traction, p. 1176, supplt. to the Ry. Gazette, June 29.
Electrification of Central of Brazil Railway. (800 words & fig.)

Railway Magazine. (London.)

1934 **656 .222.1 (.44)**
Railway Magazine, July, p. 1.
Modern **locomotive work in France.** — III. Chemins de fer de l'Est. (3 100 words, tables & fig.)

1934 **656 .222.1 (.42)**
Railway Magazine, July, p. 10.
ALLEN (C. J.). — **British locomotive practice and performance.** (4 500 words, tables & fig.)

1934 **621 .132.3 (.42)**
Railway Magazine, July, p. 33.
ALLEN (C. J.). — Britain's first **eight-coupled express engine.** — L. N. E. Ry. 2-8-2 locomotive No. 2001. « Cock o' the North ». (1 500 words & fig.)

Railway Mechanical Engineer. (New York.)

1934 **621 .85 (.73) & 625 .26 (.73)**
Railway Mechanical Engineer, June, p. 179.
Pittsburg **shops equipped to build automobile box cars.** (2 800 words, tables & fig.)

1934 **621 .134.1, 621 .138.5 & 621 .91**
Railway Mechanical Engineer, June, p. 186.
Milling rods. (1 500 words & fig.)

1934 **621 .138.5, 621 .94 & 621 .95**
Railway Mechanical Engineer, June, p. 190.
Eight difficult jobs of boring and turning. (2 600 words & fig.)

1934 **621 .43 (.73)**
Railway Mechanical Engineer, June, p. 196.
MURPHY (T. H.). — **Gas rail car converted to Diesel type.** (1 200 words & fig.)

Railway Signaling. (Chicago.)

1934 **625 .162 (.73)**
Railway Signaling, July, p. 341.
Automatic crossing gates on Illinois Central. (2 500 words & fig.)

1934 **656 .258 (.73)**
Railway Signaling, July, p. 345.
New signaling increases track capacity on the Erie. (2 000 words & fig.)

1934 **656 .258 (.71)**
Railway Signaling, July, p. 347.
Desk-lever interlocking installed on Canadian National. (1 200 words & fig.)

1934 **625 .162 (.73) & 656 .259 (.73)**
Railway Signaling, July, p. 349.
Crossing signals on Baltimore & Ohio at Braddock, Pa. (1 200 words & fig.)

1934 **656 .25 (0**
Railway Signaling, July, p. 351.
WEATHERBY (E. P.). — **Operating costs of A. C. primary system of power supply.** (1 300 words & fig.)

1934 **656 .258 (.945)**
Railway Signaling, July, p. 353.
EYERS (E. C.). — New **interlocking** in Australia. (1 100 words & fig.)

1934 **656 .253 (.73)**
Railway Signaling, July, p. 355.
Signaling a highway-railroad bridge on the New York Central. (1 000 words & fig.)

The Locomotive. (London.)

1934 **621 .132.8 (.86)**
The Locomotive, July 14, p. 198.
Six-engined « Sentinel » steam locomotives for Colombia. (2 900 words & fig.)

1934 **621 .43 (.42)**
The Locomotive, July 14, p. 203.
Oil-engined buffet railcars, Great Western Ry. (1 900 words & fig.)

1934 **621 .131.3 (.42)**
The Locomotive, July 14, p. 205.
Test run with engine No. 2001 « Cock o' the North », L. & N. E. Ry., between King's Cross & Barkston. (1 300 words & fig.)

1934 **621 .131.2**
The Locomotive, July 14, p. 207.
The **high-speed steam locomotive.** (2 700 words & fig.)

1934 **621 .335 (.47) & 621 .43 (.47)**
The Locomotive, July 14, p. 212.
4-8-2 + 2-8-4 Diesel-electric locomotive, Russian State Railways. (800 words & fig.)

1934 **621 .43 (.44)**
The Locomotive, July 14, p. 213.
Bugatti high-speed railcars, State Rys. of France and Paris, Lyons & Mediterranean Ry. (1 400 words & fig.)

1934 **621 .133.3 & 621 .138.5**
The Locomotive, July 14, p. 221.
Removing and re-fitting small locomotive boiler tubes. (1 400 words & fig.)

In Spanish.

Anales de la Asociación de Antiguos Alumnos del I. C. A. I. (Madrid.)

1934 **62. (01 & 669**
Anales de la Asociación de Antiguos Alumnos de I. C. A. I., junio, p. 307.
NAVARRETE Y DEL SOLAR (R.) & ESTEBANEZ (M. R.). — Los **rayos X** como método de investigación industrial. (3 600 palabras & fig.) (Continuará.)

1934 **621 .33 (.45)**
Anales de la Asociación de Antiguos Alumnos de I. C. A. I., junio, p. 317.
La **electrificación** de los ferrocarriles en Italia. (3 000 palabras, 1 mapa & fig.) (Continuará.)

Caminos de hierro. (Madrid.)

1934 **385**
Caminos de hierro, junio, p. 137.
MONREAL (M.) & CASTILLO (M.). — La **crisis ferroviaria** y sus posibles remedios. (1 200 palabras. (Continuará.)

Gaceta de los Caminos de hierro. (Madrid.)

1934 **656 .1 & 656 .2**
Gaceta de los Caminos de hierro, nº 3711, 1 de junio p. 61.
La **carretera y el ferrocarril.** (4 700 palabras.) (Continuará.)

Ingenieria y Construcción. (Madrid.)

1934 **385 .113 (.460)**
Ingenieria y Construcción, julio, p. 452.
La **memoria anual** de las Compañías del Norte y Madrid-Zaragoza-Alicante. (3 500 palabras.) (Continuará.)

Revista de Ingenieria Industrial. (Madrid.)

1934 **625 .21**
Revista de Ingenieria Industrial, junio, p. 183.
LAFFITTE (C.). — El funcionamiento de la **suspensión de vehículos.** III. — Influencia del amortiguamiento. (5 000 palabras & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1934 **625 .1 (.45)**

nali dei lavori pubblici, marzo, p. 191.

IORELLI (J.). — **La nuova ferrovia** della Sardegna so-Sassari-Tempio-Palau. (11 400 parole & fig.) ntinua.)

1934 **62. (01**

nali dei lavori pubblici, marzo, p. 233.

AMOLETTO (C. F.). — **Il fenomeno di rottura ed il** ento limite nei **materiali da costruzione.** (6 500 pa- & fig.)

1934 **656 .222.1**

nali dei lavori pubblici, marzo, p. 266.

ulle **alte velocitá ferroviarie.** (5 400 parole & fig.)

L'Ingegnere. (Roma.)

1934 **624 .1**

ngegnere, 1. luglio, N° 13, p. 650.

AMOLETTO (C. F.). — **Esperienze su grandi lastre.** 00 parole & fig.)

---

vista tecnica delle ferrovie italiane. (Roma.)

1934 **651 (.45) & 313 : 656 .225 (.45)**

ista tecnica delle ferrovie ital., n° 6, 15 giugno, p. 351.

ARGIULO (G.). — Meccanizzazione della **statistica trasporti** delle merci presso le Ferrovie Italiane o Stato. (6 500 parole & 6 quadri.)

1934 **625 .1 (.45) & 621 .33 (.45)**

ista tecnica delle ferrovie ital. n° 6, 15 giugno, p. 373.

IARTINO (V. de). — **La Direttissima Bologna-**enze. (11 300 parole, 8 quadri, & fig.)

1934 **621 .335 (.45)**

ista tecnica delle ferrovie ital. n° 6, 15 giugno, p. 410.

IANCHI (G.). — **La unificazione delle locomotive** triche **a corrente continua** a 3 000 volt. Locomo- gruppo. E. 424, E. 326, E. 626, E. 428 e automo- i gruppo E. 24. (3 200 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **62. (01**

Ingenieur, N^r 26, 29 Juni, p. B. 88.

IJLAARD (P. P.). — **Een nieuwe methode voor het** ekenen **van platen** en de toepassing daarvan op het ien van de wanden van gedrukte staven. (4 900 rden & fig.)

1934 **656 (.43)**

Ingenieur, N^r 26, 29 Juni, p. V. 55.

ONGH (D.). — **Monopolie, of gereglementeerde con-**entie **bij het Verkeerswezen in Duitschland.** (2 700 rden.)

1934 **62. (01 & 691**

De Ingenieur, N^r 27, 6 Juli, p. Bt. 57.

RENGERS (N. J.). — **Proefnemingen op kolommen van beton en gewapend beton.** (3 600 woorden & fig.) (Slot.)

1934 **62. (01**

De Ingenieur, N^r 29, 20 Juli, p. Mk. 33.

PFEIFFER (J. Ph.). — **Een belangrijke publicatie met betrekking tot de kennis en het onderzoek van materialen met plastische eigenschappen.** (2 100 woorden.)

Spoor- en Tramwegen. (Utrecht.)

1934 **624 .3 (.492)**

Spoor- en Tramwegen, N^r 14, 3 Juli, p. 359.

Spoor- en Tramwegen, N^r 15, 17 Juli, p. 397.

FOEST (A. H.). — **De nieuwe brug** over de Waal in het 2e hoofdspoor Zaltbommel-Waardenburg. (4 100 woorden & fig.) (Slot volgt.)

1934 **385 .113 (.492)**

Spoor- en Tramwegen, N^r 14, 3 Juli, p. 362.

De Nederlandsche Spoorwegen over 1933. (1 900 woorden.)

1934 **656 (.43)**

Spoor- en Tramwegen, N^r 14, 3 Juli, p. 370.

Duitsche verkeerspolitiek van dezen dag. (2 500 woorden.)

1934 **621 .33 (.492)**

Spoor- en Tramwegen, N^r 15, 17 Juli, p. 393.

VAN LESSEN (J.). — **Electrificatie Rotterdam-Dordrecht. De electrotechnische Werkzaamheden.** (1 200 woorden & fig.) (Slot volgt.)

In Portuguese.

Gazeta dos Caminhos de ferro. (Lisboa.)

1934 **385. (06.4 (.469)**

Gazeta dos caminhos de ferro, N° 1118, 16 de julho, p. 349.

GALVAO (L.). — **Os caminhos de ferro na Exposição colonial portuguesa.** (3 400 palavras & fig.)

In Rumanian.

(= 599)

Revista tecniča C. F. R. (Bucuresti.)

1933 **625 .141 = 599**

Revista tecnica C. F. R., June, p. 129.

MAZILU (M. C.). — **Laboratory tests on ballast** (8 300 words, 9 tables & fig.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

OCTOBER (1934)

[016. 385. (02]

I. — BOOKS.

In French.

1934 625 .7 (06

Association Internationale Permanente des Congrès la Route.

VIIe Congrès : Munich 1934.

Paris, Secrétariat Général de l'Association précitée, avenue d'Iéna. 92 rapports.

1934 656 .254

Association Internationale Permanente des Congrès la Route.

VIIe Congrès : Munich 1934. 2e Section : Circulation, exploitation et Administration. 4e question : Les moyens propres à assurer la sécurité de la circulation : en ville; en rase campagne; aux passages à niveau des chemins de fer. Législation — Réglementation — Signalisation.

Paris, Secrétariat Général de l'Association précitée, avenue d'Iéna. 11 rapports.

1934 016 .385 (.495)

Catalogue de la bibliothèque des Chemins de fer de l'Etat hellénique.

Athènes, Direction Générale des chemins de fer. 1 vol., 72 pages.

1934 621 .116

ARRACUS (K.) et RIVA-BERNI (A. de).

Voûtes de foyers.

Paris (VIe), Librairie Polytechnique Ch. Béranger. 1 volume (16 × 25), 115 pages, 73 figures. (Prix : 30 francs français.)

1934 385 .587

LE CHATELIER (H.).

Le taylorisme.

Paris, Dunod, 92, rue Bonaparte. 1 volume (16 × 25), 240 pages et 9 figures. (Prix : 24 francs français.)

1934 621. (02

ACHTERGAL (A.).

Guide pour l'exécution des dessins de machines.

Paris et Liége, Ch. Béranger. 1 volume, 96 pages et 92 figures. (Prix : 18 francs français.)

1934 669

PORTEVIN (A.).

Introduction à l'étude des traitements thermiques des produits métallurgiques.

Paris, Aciers spéciaux, Métaux et Alliages, 4, rue Féron. 1 volume, 120 pages et 66 figures. (Prix : 20 fr. français.)

1934 313 .385 (.437)

Statistique de transport des Chemins de fer de l'Etat tchécoslovaque pour l'exercice 1933.

Praha, Nákladem Csl. Státnich drah., Tiskl Josef Pacl v Strakonicich. 1 volume, 236 pages.

1934 625 .62

UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 2e question : Ateliers : Disposition et organisation, travaux d'entretien du matériel roulant (tramways et autobus). Rapport de MM. DEVIENNE et B. DZIUGIELL.

Bruxelles, Union Internationale de Tramways, 18, avenue de la Toison d'Or. 1 fascicule, 31 pages et figures.

1934 625 .17, 621 .392 & 625 .143.4

UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 3e question : Progrès réalisés dans l'entretien et la construction des voies, spécialement dans le domaine de la soudure des métaux. Rapport de M. F. TRICOT.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 37 pages et figures.

1934 621 .33

UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 4e question : Partie A : Les moteurs de traction et la récupération, rapport de M. L. BACQUEYRISSE; **partie B : Comparaison des divers systèmes de freinage par récupération,** rapport de M. von LENGERKE.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 119 pages et figures.

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

1934 625 .62 & 669 .1
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 5e question : Emploi des métaux légers dans la construction du matériel roulant (tramways et autobus). Rapport de M. M. R. ZEHNDER.

Bruxelles, Secrétariat de l'Union précitée. 18, avenue de la Toison d'Or. 1 brochure, 33 pages et figures.

1934 621 .43
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1349. 6e question : Emploi du moteur Diesel; état du développement d'après les dernières expériences dans tous les pays, à l'exception de la Grande-Bretagne. Rapport de M. PREUSS.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 fascicule, 12 pages, figures et annexes.

1934 625 .162
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 7e question : Appareils de traversée à niveau des voies; passages à niveau. Partie A : Appareils de traversée à niveau des voies. Rapport de M. G. BERGER.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 20 pages, 10 planches, 17 tableaux et figures.

1934 656 .254
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 7e question : Appareils de traversée à niveau des voies; passages à niveau. Partie B : Passages à niveau. Rapport de M. A. FALKENBERG.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 13 pages et figures.

1934 621 .43
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 8e question : Emploi des automotrices. Partie A : **Améliorations récentes et résultats acquis,** rapport de M. F. LEVEL; partie B : **Emploi des automotrices à accumulateurs électriques,** rapport de M. le Comm. P. LO BALBO.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 22 pages et figures.

1934 656 .1 & 656 .2
UNION INTERNATIONALE DE TRAMWAYS, DE CHEMINS DE FER D'INTERET LOCAL ET DE TRANSPORTS PUBLICS AUTOMOBILES.

XXIVe Congrès international, Berlin, juillet 1934. 11e question : Rail et Route. Rapport de la Commission.

Bruxelles, Secrétariat de l'Union précitée, 18, avenue de la Toison d'Or. 1 brochure, 71 pages.

In German.

1934 624
LEHR (E.).

Spannungsverteilung in Konstruktionselementen.

Berlin, V-D-I Verlag. 1 Band, 64 Seiten mit 179 Abbildungen. (Preis : 7.50 R.M.)

1934 621 .11
SCHMIDT (E.).

Wasserumlauf in Dampfkesseln.

Berlin, V-D-I-Verlag. 1 Band, 23 Seiten und 26 Abbildungen. (Preis : 5 R.M.)

1934 66
von ZEERLEDER (A.).

Technologie des Aluminiums und seiner Leichtlegierungen.

Leipzig, Akademische Verlagsgesellschaft. 1 Band, 289 Seiten mit 204 Abbildungen. (Preis : 14 R.M.)

In English.

1934 625 .1 (.54
BAILEY (V.), C. I. E., C. B. E., M. Inst. C. E.

Permanent way through the Khyber.

London, E.C. 4. Jarrolds Publishers (London) Ltd., 34, Paternoster Row. (9 1/2 × 6 inches.) 287 pages. (Price : 18 sh.)

1934 669
de BELIN (G. A.) & BRADBURY (E. E. G.).

Key words to the metallurgy of steel.

London W. C. 2. The Louis Cassier Co. Ltd., 22, Henrietta Street. (Price : 9 d. net.)

1934 621 .3
BRIAN REED.

Railway engines of the world.

London. Humphrey Milford; Oxford University Press. 159 pages (8 1/2 × 5 1/2 inches), 76 half-tone illustrations. (Price : 3 sh. 6 d. net.)

1934 62
DU-PLAT-TAYLOR (F. M.), M. Inst. C. E.

Dock, wharves, and piers.

London. Ernest Benn, Ltd. (Price : 45 sh.)

1934 62
GUILLET (G. L.).

Kinematics of machines.

New York. John Wiley & Sons, Inc. London. Chapman and Hall, Ltd. Third edition. (Price : 18 sh. 6 d. net.)

1934 385. (09 (.54
History of Indian Railways, 1934.

Delhi. The Manager of Publications, Government of India Railway Department. 294 pages (13 1/4 × 8 1/2 inches), coloured folding map. (Price : Rs. 6, or 9 sh. 9 d.)

1934 51. (08 & 621

ES (H. C.).

Mathematical tables. Reprinted from Searles and es Field Engineering, with additions.

New York. John Wiley & Sons, Inc. London. Chapn and Hall, Ltd. Second edition. (Price : 8 sh. 6 d. t.)

1934 621

MBALL (A. L.).

Vibration prevention in engineering.

New York. John Wiley and Sons, Inc. London. Chapan & Hall, Ltd. (Price : 15 sh. 6 d. net.)

1934 51. (08

OVELACE (E. S. M.).

Universal spiral tables for railroad and electric tramay lines.

Montreal. Published by the Author. Westmount, 457, m-avenue. (Price : 5 sh. post free.)

1934 621 .110

EYER (J. H.).

Power plant testing.

London, W. C. 2. McGraw-Hill Publishing Co., Ltd., ldwych House. (Price : 30 sh. net.)

1934 62. (01 & 621 .39

ULLIN (V. E.), C. B. E.

Engineering radiography.

London. George Bell & Sons. (Price : 45 sh.)

1934 722

ODGER (J. M.), Assoc. M. Inst. C. E.

Engineering drawings, specifications, and quantities.

London. Ernest Benn, Ltd. (Price : 21 sh.)

1934 621

LOCUM (S. E.).

Noise and vibration engineering.

London. Crosby Lockwood and Son. (Price : 21 sh. t.)

1934 62. (01 & 621

TIMOSHENKO (S.), associate-professor of Mechanical Engineering, Yale University, New Haven, Conn., Assoc.-Mem. A. S. M. E.

Theory of elasticity.

New York. McGraw-Hill Book Co., Inc. Engineering Societies Monograph Series. (5 3/4 × 9 inches), 416 pages, 203 figs. (Price : $ 5.00.)

1934 62. (01

TURNER (C. A. P.).

Elasticity, structure, and strength of materials used in engineering construction.

Minneapolis, Minn. Published by the Author; 300, Builders Exchange Building. Cloth. (6 × 10 inches), 416 pages, illust., diagrams, charts, tables. (Price : $ 6.00.)

In Italian.

1934 721

COLONNELLI (G.).

La statica delle costruzioni.

Bologna, Libreria Internazionale L. Cappelli. 1 volume, 260 pagine con figure. (Prezzo : 30 L.)

1933 656 .1 (.45)

MINISTERO DELLE COMUNICAZIONI. ISPETTORATO GENERALE FERROVIE, TRAMVIE, AUTOMOBILI.

Relazione e dati statistici sui servizi pubblici automobilistici estraurbani per gli anni 1928-1929-1930. Parte I : Italia Settentrionale. Parte II : Italia Centrale, Meridionale e Insulare.

Roma, Istituto Poligrafico dello Stato. 2 volumi, respettivamente di 458 e 438 pagine.

[016. 385. (05]

II. — PERIODICALS.

In French.

Annales des ponts et chaussées. (Paris.)

1934 624 .3 (.44)

nnales des ponts et chaussées, part. tech., mai-juin, p. 388.

SOLEIL. — Note sur le **montage d'un tablier métallique** franchissant la Sambre à Jeumont. (1 500 mots fig.)

1934 624 .7 (.44)

nnales des ponts et chaussées, part. tech., mai-juin, p. 400.

LE PORT. — **Pont sous rails à poutres droites en ton armé, sur le canal de l'Ourcq, à Paris.** (1 500 mots fig.)

Bulletin de l'Union internationale des chemins de fer. (Paris.)

1934 385 .113 (.42)

Bull. de l'Union intern. des ch. de fer, juin, p. 185.

SHERRINGTON (C. E. R.). — **Les quatre grandes compagnies des chemins de fer de Grande-Bretagne** pendant l'exercice 1933. (14 700 mots & 31 tableaux.)

1934 385 .113 (.43)

Bull. de l'Union intern. des ch. de fer, juin, p. 205.

La compagnie des chemins de fer allemands pendant l'exercice 1933. (8 800 mots.)

1934 656 .1 (.4) & 656 .2 (.4)

Bull. de l'Union intern. des ch. de fer, juillet-août, p. 255.

Rapport des Chemins de fer allemands et des Chemins de fer Fédéraux suisses sur la question : **Concurrence**

et coopération en trafics voyageurs et marchandises entre chemin de fer et automobile. (Juin 1934.) (24 500 mots.)

1934 **313 .385**
Bull. de l'Union intern. des ch. de fer, juillet-août, p. 282.
Statistique internationale des chemins de fer. (2 900 mots.)

Chronique des transports. (Paris.)

1934 **385 .56 (.44)**
Chronique des transports, n° 14, 25 juillet, p. 5.
Les chemins de fer et le plan des grands travaux contre le chômage. (4 000 mots.)

1934 **656 .224 (.44)**
Chronique des transports, n° 15, 10 août, p. 3.
Les chemins de fer français et le tourisme. (2 800 mots.)

Génie civil. (Paris.)

1934 **625 .1 (.45) & 625 .13 (.45)**
Génie civil, n° 2711, 28 juillet, p. 77.
La ligne directe de Bologne à Florence et le grand tunnel de l'Apennin. (4 600 mots & fig.)

1934 **665 .882. (06**
Génie civil, n° 2711, 28 juillet, p. 86.
RAZOUS (P.). — Le XI° Congrès international de l'acétylène et de la soudure autogène (Rome, 5-15 juin 1934). (5 300 mots.)

1934 **691**
Génie civil, n° 2712, 4 août, p. 107.
CHAUDY (F.). — Contribution théorique à l'étude d'un problème de granulométrie. (2 700 mots et fig.)

1934 **625. (01 (.64)**
Génie civil, n° 2712, 4 août, p. 112.
La ligne de chemin de fer d'Oujda à Fès (Maroc). (800 mots & fig.)

1934 **625 .4 (.44)**
Génie civil, n° 2713, 11 août, p. 121. — N° 2714, 18 août, p. 145.
STAHL. — L'état actuel du réseau métropolitain de Paris et les travaux récemment exécutés. (5 600 mots.)

1934 **62. (01 & 691**
Génie civil, n° 2713, 11 août, p. 130.
MARCOTTE (E.). — Dosage au laboratoire des bétons à employer sur les chantiers. (2 300 mots & fig.)

1934 **531**
Génie civil, n° 2714, 18 août, p. 141.
ANTONI (A.). — L'équilibrage des pièces tournantes et les machines à équilibrer. (5 200 mots & fig.) (A suivre.)

1934 **669 .1**
Génie civil, n° 2715, 25 août, p. 165.
PERSOZ (L.). — Les aciers spéciaux. Classification et emplois. Influence des éléments additionnels. (4 500 mots & fig.)

1934 **53**
Génie civil, n° 2715, 25 août, p. 168.
ANTONI (A.). — L'équilibrage des pièces tournant et les machines à équilibrer. (3 800 mots & fig.)

L'Allègement dans les Transports. (Lucerne.)

1934 **625 .2 (**
L'Allègement dans les Transports, juillet-août, p. 8
GILARDI (U.). — De l'allègement du matériel ro lant par l'emploi de métaux spéciaux. (2 100 mots fig.) (Suite.)

La Science et la Vie. (Paris.)

1934 **6**
La Science et la Vie, août, p. 122.
MAGADOUX (R.). — Pas d'amélioration économiq sans réforme des transports. (7 500 mots & fig.)

La Traction électrique. (Paris.)

1934 **621 .**
La Traction Electrique, mai, p. 85.
BOUILLOT (J.). — L'électrification des chemins fer. (9 300 mots & fig.)

1934 **621 .33 (.4**
La Traction Electrique, mai, p. 96.
L'électrification des chemins de fer de l'Etat itali (200 mots.)

Les Chemins de fer et les Tramways. (Paris

1934 **656 .1 & 656**
Les Chemins de fer et les Tramways, août, p. 184.
La concurrence de la route et du rail. (3 200 mot

1934 **621 .13**
Les Chemins de fer et les Tramways, août, p. 189.
Dispositif d'échappement pour locomotives à vap (2 500 mots & fig.)

1934 **621 .335 (.49**
Les Chemins de fer et les Tramways, août, p. 191.
VIE (G.). — Le matériel de traction électrique les Chemins de fer fédéraux suisses. (2 700 mots & fi

1934 **621 .43 (.4**
Les Chemins de fer et les Tramways, août, p. 193.
KEULEYAN (L.). — Locomotive Diesel-électriq pour la Russie. (3 600 mots & fig.)

1934 **656 .211.5 & 656 .212**
Les Chemins de fer et les Tramways, août, p. 198.
Récents progrès de la technique routière des re tements pour cours de gares, chemins d'accès, quais aires diverses. (5 400 mots & fig.)

Les transports modernes. (Paris.)

1934 **656 .254**

s transports modernes, avril-juin, p. 33.

VILLEFRANCHE (X. de). — Un système méca-ique efficace de **commande automatique des trains.** 000 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1934 **624 .2 (.52)**

Ossature métallique, juillet-août, p. 356.

TAKABEYA (F.). — Les applications de la **poutre erendeel** au Japon. (1 000 mots & fig.)

1934 **625 .21**

Ossature métallique, juillet-août, p. 374.

SELEZNEFF (N.). — Auscultation tensométrique de ssature métallique **des voitures motrices** du réseau s Tramways Unifiés de Liége et Extensions. (1 000 ots & fg.)

1934 **721**

Ossature métallique, juillet-août, p. 379.

JOUKOFF (A. S.). — Principes d'application de la asticité au calcul des **constructions métalliques** hyper-atiques. (3 800 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1934 **656 .254 (.44) & 656 .257 (.44)**

evue générale des chemins de fer, août, p. 81.

GAILLARD (P.). — Les **transmetteurs d'ordre Saint-iamond-Granat.** Leur emploi comme appareils de cor-spondance entre les postes de signaux de la gare Paris P. L. M. (6 400 mots & fig.)

1934 **621 .118 (.44) & 621 .133.3 (.44)**

evue générale des chemins de fer, août, p. 103.

CHAN. — Note sur une **avarie de chaudière à haute** ression. (4 200 mots & fig.)

1934 **385 .113 (.493)**

evue générale des chemins de fer, août, p. 115.

Résultats du septième exercice (1933) de la Société ationale des Chemins de fer belges. (5 700 mots.)

1934 **385. (01 (.67)**

evue générale des chemins de fer, août, p. 123.

L'inauguration du **Chemin de fer Congo-Océan.** (1 400 ots.)

1934 **621 .87**

evue générale des chemins de fer, août, p. 125.

Grue soudée de 50 t. à flèche très longue pour che-ins de fer. (1 000 mots & fig.)

Revue universelle des Mines. (Liége.)

1934 **669 .1**

evue universelle des mines, n° 15, 1er août, p. 408.

KERSTEN (P.). — Contribution à l'étude des phé-omènes d'hérédité morphologique dans les **aciers hypo-utectoïdes.** (3 800 mots & fig.)

1934 **624 .3**

Revue universelle des mines, 1er août, p. 429.

VIERENDEEL (A.). — **Treillis en losange.** (800 mots & fig.)

In German.

Die Lokomotive. (Wien.)

1934 **621 .132.3**

Die Lokomotive, August, S. 137.

Umbau-**Heissdampf-Pacific-Schnellzugslokomotive** der französischen Nordbahn. (900 Wörter & Abb.)

1934 **621 .13 (.73)**

Die Lokomotive, August, S. 139.

Neuere Fortschritte im **amerikanischen Lokomotivbau** I. (3 800 Wörter & Abb.) (Fortsetzung folgt.)

Elektrische Bahnen. (Berlin.)

1934 **621 .33**

Elektrische Bahnen, Juliheft, S. 150.

VOGEL (Th.). — Arbeitsorganisation und Zeitaufnahme der Kettenwerksmontage bei der **Elektrisierung** zweigleisiger Bahnen. (3 400 Wörter & Abb.)

1934 **625 .113**

Elektrische Bahnen, Juliheft, S. 164.

SCHÄTZL (J.). — Abbildung von **Gleisbögen** im verzerrten Massstab. (1 000 Wörter & Abb.)

Glasers Annalen. (Berlin.)

1934 **621 .131**

Glasers Annalen, Heft 2, 15. Juli, S. 9. — Heft 3, 1. August, S. 17.

NORDMANN (H.). — Ist die **Dampflokomotive** veraltet ? (10 000 Wörter & Abb.) (Schluss folgt.)

Organ für die Fortschritte des Eisenbahnwesens. (Berlin.)

1934 **621 .133**

Organ für die Fortschritte des Eisenbahnwesens, Heft 15, 1. August, S. 279. — Heft 16, 15 August, S. 298.

MÜLLER (C. Th.). — Die **Wärmeübertragung** im **Lokomotivrauchrohr.** (16 000 Wörter, 2 Tafeln & Abb.)

1934 **625 .23 (.73) & 669**

Organ für die Fortschritte des Eisenbahnwesens, Heft 16, 15. August, S. 291.

WITTE (Fr.). — **Ganzaluminium. — Personenwagen** in den Vereinigten Staaten. (1 800 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 **62. (01**
Zeitsch. des Ver. deutsch. Ing., Nr. 31, 4. August, S. 921.
THUM (A.) & BAUTZ (W.). — Steigerung der **Dauerhaltbarkeit gekerbter Konstruktionsteile** durch Eigenspannungen. (4 200 Wörter & Abb.)

1934 **621 .335**
Zeitsch. des Ver. deutsch. Ing., Nr. 32, August, S. 949.
SACHS (K.). — Fortschritte im Bau **elektrischer Lokomotiven** Wagenteil. (5 900 Wörter & Abb.)

1934 **691**
Zeitsch. des Ver. deutsch. Ing., Nr. 34, 25. August, S. 1001.
SCHNEIDER (A.). — Eisenhammerschlag als **Rostschutzpigment.** (1 200 Wörter & Abb.)

1934 **625 .141**
Zeitsch. des Ver. deutsch. Ing., Nr. 34, 25. August, S. 1011.
Verladebecherwerk zur **Bettungsreinigung.** (600 Wörter & Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 **385 .517.6 (.43)**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 31, 2. August, S. 541.
KRATZ. — Die **Krankenkasse** der Reichsbahn nach der Neugestaltung der Sozialversicherung. (4 600 Wörter.)

1934 **656 .1 (.43) & 656 .225 (.43)**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 31, 2. August, S. 546.
REFFER. — Die **Motorisierung des Stückgutverkehrs.** (2 800 Wörter & Abb.)

1934 **625 .258**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 32, 9. August, S. 558.
BERGHAMMER (G.). — Die **Ausrückhemmschuhbremse.** Ein Beitrag zur Einführung leichter, mechanischer Bremsmittel auf Rangierbahnhöfen. (2 500 Wörter & Abb.)

1934 **656 (.45)**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 33, 16. August, S. 573. Nr. 34, 23. August, S. 589.
BLUM (E.). — Zum Verkehrswesen Italiens. (9 300 Wörter & Abb.)

1934 **621 .133.1**
Zeitung des Vereins Mitteleurop. Eisenbahnverw., Nr. 34, 23. August, S. 597.
KAUFMANN. — Massnahmen zum **Einsparen von Kohlen im Lokomotivbetrieb.** (4 600 Wörter & Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 **656 .25**
Zeitsch. für das gesamte Eisenb.-Sicherungsw., Nr. 1
1. August, S. 121. Nr. 11, 20. August, S. 137.
HOFMANN (F.). — Die punktweise Geschwindig
keitsbegrenzung bei der **optischen Zugbeeinflussung**
(7 500 Wörter & Abb.)

1934 **656 .257 & 721**
Zeitsch. für das gesamte Eisenb.-Sicherungsw., Nr. 1
20. August, S. 133.
MÜLLER (F.). — Verlegung von **Stellwerkskabeln i**
Betonkanälen. (3 000 Wörter & Abb.)

In English.

Brotherhood of Locomotive Firemen and Enginemen's Magazine. (Cleveland, Ohio.)

1934 **385 .51 (.73) & 385 .517 (.73**
Brotherhood, Loc., Firemen & Enginemen's Magazin
July, p. 3.
Two new **railroad labor laws** make history. — Enac
ment of amendments to Railway Labor Act and
Railroad Retirement Act [Pension measure] won aft
long and strenuous campaign by Standard Railroa
Labor Organizations. (12 000 words.)

Engineer. (London.)

1934 **625 .13 (.42**
Engineer, No. 4098, July 27, p. 80.
The **Mersey tunnel,** No. III. (5 000 words & fig.)

1934 **624. (0 & 66**
Engineer, No. 4098, July 27, p. 93.
Aluminium floor for an old bridge. (3 700 words
fig.)

1934 **62. (0**
Engineer, No. 4098, July 27, p. 95.
A direct reading viscometer. (800 words & fig.)

1934 **621**
Engineer, No. 4098, July 27, p. 96.
A new high-speed **moulding machine.** (250 words
fig.)

1934 **621**
Engineer, No. 4099, August 3, p. 104. — No. 410
August 10, p. 131.
ENGEL (F. V. A. E.). — **The Venturi flume.** (9 5
words, tables & fig.)

1934 **621 .4**
Engineer, No. 4099, August 3, p. 111.
Further experiments on **cylinder wear.** (1 900 wor
& fig.)

1934 **621 .131.3 (.42) & 621 .133 (.42**
Engineer, No. 4099, August 3, p. 118.
Tests of a locomotive boiler. (3 600 words & fig.)

1934 627 (.44) & 656 .213 (.44)
ngineer, No. 4100, August 10, p. 128. — No. 4101, August 17, p. 152.
Cherbourg Harbour works. (4 100 words & fig.)

1934 62. (01
ngineer, No. 4100, August 10, p. 142.
An acoustic process for the examination of stress. 400 words & fig.)

1934 62. (01 & 621 .95
ngineer, No. 4101, August 17, p. 160.
VARLEY (G.). — **Durability of twist drills machining cast iron.** (900 words, tables & fig.)

1934 621 .132.3 (.42) & 621 .132.5 (.42)
ngineer, No. 4101, August 17, p. 168.
L. M. S. **4-6-0 mixed traffic engines.** (800 words & g.)

1934 621 .31
ngineer, No. 4101, August 17, p. 170.
Outdoor **metal-clad switchgear** and centrovisory control equipment. (3 200 words & fig.)

Engineering. (London.)

1934 625 .1 (.45)
ngineering, No. 3576, July 27, p. 84. — No. 3579, August 17, p. 159.
The Bologna-Florence « Direttissima » (5 200 words fig.)

1934 621 .43 (.45)
ngineering, No. 3577, August 3, p. 116.
Motor rail coaches for the Italian State Railways. 800 words & fig.)

1934 625 .13 (.42)
ngineering, No. 3577, August 3, p. 126.
HODGSON (J. L.). — **Problems of the Mersey tunel air-flow meters.** (1 200 words.)

1934 656 .212.6 (.43)
ngineering, No. 3577, August 3, p. 128.
Motor-lorry loading crane. (500 words & fig.)

1934 621 .43
ngineering, No. 3578, August 10, p. 136.
HORIAK (E. A. V.). — **Crankshaft and big-end earings for high speed compression-ignition engines.** 4 600 words & fig.)

1934 62. (01
ngineering, No. 3578, August 10, p. 139.
Fatigue-testing machine for wire. (2 000 words.)

1934 621 .87 (.43)
ngineering, No. 3578, August 10, p. 143.
50-ton locomotive crane with 115 ft. jib. (1 200 words fig.)

1934 621 .31
Engineering, No. 3578, August 10, p. 146.
66-kv. outdoor metal-clad switchgear for Stepney substation. (800 words & fig.)

1934 621 .133.4 & 621 .133.5
Engineering, No. 3578, August 10, p. 147.
Back pressure in the locomotive blast pipe. (1 800 words.)

1934 621 .31
Engineering, No. 3578, August 10, p. 155.
Oil-purification installation at the Swindon grid substation. (1 600 words & fig.)

1934 621 .94 (.43)
Engineering, No. 3579, August 17, p. 168.
Universal **centreless grinding machine.** (2 400 words & fig.)

1934 621 .116
Engineering, No. 3579, August 17, p. 176.
BROWNLIE (D.). — **Very low ash-content coal.** (2 300 words.)

1934 621 .132.3 (.42) & 621 .132.5 (.42)
Engineering, No. 3579, August 17, p. 180.
4-6-0 type mixed traffic locomotive, for the London Midland & Scottish Ry. (300 words.)

Engineering News-Record. (New York.)

1934 625 .111 (.73) & 625 .13 (.73)
Engineering News-Record, No. 3, July 19, p. 65.
Railroad **grade-crossing** structures to meet every requirement. (3 500 words & fig.)

1934 725 .36
Engineering News-Record, No. 3, July 19, p. 77.
MERCER (L. B.). — Some basic principles of **grain elevator** design. (2 800 words & fig.)

1934 625 .13
Engineering News-Record, No. 4, July 26, p. 97.
MERRIMAN (R. M.). — Driving 91 miles of **tunnels** on the Colorado River aqueduct. (4 500 words & fig.)

1934 624 .2
Engineering News-Record, No. 4, July 26, p. 112.
NILES (A. S.), VERNIER (R. L.) & CAMPBELL (W. A.). — Checking moment computations for **rigid frames.** — Values obtained by Cross method, verified by determining joint rotations by two independent formulas, also by using one of the formulas to check angular rotations of the columns. (1 500 words & fig.)

1934 628 (.73)
Engineering News-Record, No. 5, August 2, p. 129.
Hetch Hetchy **water supply** completed. — A series of four articles commemorating the end of 20 years of construction on San Francisco's Mountain water supply system, with bibliography. (12 000 words & fig.)

1934 **627 (.73)**
Engineering News-Record, No. 6, August 9, p. 163.
Well points dry seaside trench for Fort Monroe **wall construction.** (2 400 words & fig.)

1934 **694**
Engineering News-Record, No. 6, August 9, p. 172.
TRAYER (G. W.). — Data on **structural use of plywood** from two new test series. (4 000 words & fig.)

Institution of Civil Engineers. (London.)

1934 **621 .83**
Institut. of Civil Engineers, Selected Engineering Papers, No. 134.
BROWNE (A. Ch. Ll.). — The manufacture of **gears.** (21 000 words & fig.)

1934 **526**
Institut. of Civil Engineers, Selected Engineering Papers, No. 135.
ANDERSON (D. J.). — **Aerial surveying.** (9 800 words & fig.)

1934 **526**
Institut. of Civil Engineers, Selected Engineering Papers, No. 137.
DUNCAN (R. D.) & JONES (E. M. R.). — **Survey work on the Lochaber water-power scheme.** (18 000 words & fig.)

1934 **62. (01 & 621**
Institut. of Civil Engineers, Selected Engineering Papers, No. 138.
BOOTH (H.). — **Elastic failure of thick cylinders.** (9 500 words & fig.)

1934 **62. (01 & 621**
Institut. of Civil Engineers, Selected Engineering Papers, No. 139.
BAILEY (A.). — **Wind pressures** on buildings. (8 500 words & fig.)

1934 **656 .253 (.54) & 656 .256 (.54)**
Institut. of Civil Engineers, Selected Engineering Papers, No. 140.
SMITH (A. H.). — **Signalling and block working** on railways in India. (13 500 words & fig.)

1934 **62. (01 & 669 .1**
Institut. of Civil Engineers, Selected Engineering Papers, No. 142.
LAVERY (J. H.) & SOUTHWELL (R. V.). — **New methods of testing by impact.** (13 000 words & fig.)

1934 **627 (.931) & 656 .213 (.931)**
Institut. of Civil Engineers, Selected Engineering Papers, No. 143.
MARCHBANKS (J.). — **Wellington harbour,** N. Z., and its development. (5 800 words & fig.)

1934 **621 .6 (.5 + .6)**
Institut. of Civil Engineers, Selected Engineering Papers, No. 144.
TULLOCH (S. S. G.). — **Laying a 30-inch suction pipe** in the Dead Sea. (7 900 words.)

1934 **625 .143.1**
Institut. of Civil Engineers, Selected Engineering Papers, No. 145.
INGLIS (R. A.). — The proportioning of railway **rail-sections** from an economic standpoint. (5 300 words & fig.)

1934 **624. ((**
Institut. of Civil Engineers, Selected Engineering Papers, No. 146.
HAY (J. B. M.). — An electrical analogy for use in the design of **statically indeterminate structures.** (8 900 words & fig.)

1934 **625 .14 (01**
Institut. of Civil Engineers, Selected Engineering Papers, No. 147.
GONGH (G. S.). — **Stresses in railway-track** by an extension of the theorem of three moments, and some deductions therefrom. (10 000 words & fig.)

1934 **627 (.943) & 656 .213 (.943)**
Institut. of Civil Engineers, Selected Engineering Papers, No. 148.
CULLEN (E. B.). — **The construction of Brett's wharf,** Brisbane. (3 700 words & fig.)

1934 **624 .8 (.593)**
Institut. of Civil Engineers, Selected Engineering Papers, No. 149.
THOMPSON (F. W.). — **The mechanical gear of Bangkok memorial bridge, Siam.** (5 800 words & fig.)

1934 **62. (01 & 621**
Institut. of Civil Engineers, Selected Engineering Papers, No. 150.
VIVIAN (A. C.). — **Elasticity.** (9 000 words, tables & fig.)

1934 **624 .2 (01**
Institut. of Civil Engineers, Institution lecture to students Session, 1932-33.
GRIBBLE (C.). — **Impact in railway bridges** — retrospect and present-day aspect. (12 600 words.)

Mechanical Engineering. (New York.)

1934 **621 .31 (.73), 627 .82 (.73) & 691 (.73)**
Mechanical Engineering, August, p. 451.
DAY (C. M.) & BIER (P.). — **Penstocks** for Boulder dam. (10 000 words & fig.)

1934 **621 .131.3**
Mechanical Engineering, August, p. 486.
New tests on steam locomotives. (3 000 words & fig.

Modern Transport. (London.)

1934 **656 .222.1 & 656 .22**
Modern Transport, No. 802, July 28, p. 3.
Speed and punctuality. — Vital factors in railway working. (2 000 words.)

1934 **656 .25 (.42)**
odern Transport, No. 802, July 28, p. 4.
Automatic signals. — « Stop and proceed » rule. 00 words.)

1934 **625 .232 (.42)**
odern Transport, No. 802, July 28, p. 5.
New rolling stock for British Railways. — **Tourist ains and vestibule coaches.** (1 700 words & fig.)

1934 **621 .335 (.42) & 621 .43 (.42)**
odern Transport, No. 802, July 28, p. 7.
British-built oil-electric train in Brazil. — Express rvices between Santos and Sao Paulo. (1 500 words fig.)

1934 **656 .1 (.42)**
odern Transport, No. 802, July 28, p. 9.
Bus bodies with all-steel frames. (1 200 words & fig.)

1934 **621 .33 (.42)**
odern Transport, No. 803, August 4, p. 3.
Manchester suburban railway electrification. (1 600 ords & fig.)

1934 **385. (09 (.64 + .65)**
odern Transport, No. 803, August 4, p. 5.
New French colonial railway. — Link between Alge- and Morocco. (1 200 words & fig.)

1934 **656 .225 (.42)**
odern Transport, No. 803, August 4, p. 7.
Steel containers for L. M. S. Ry. — New type of or ensures rigidity. (600 words & fig.)

1934 **621 .9 & 669 .1**
odern Transport, No. 803, August 4, p. 9.
Tools and steel. — Recent processes and develop- ents. (2 000 words.)

1934 **313 : 385 & 656 .2**
odern Transport, No. 804, August 11, p. 3.
Economy in railway working. — Effective use of atistics. (2 400 words.)

1934 **656 .222 (.4)**
odern Transport, No. 804, August 11, p. 4.
Continental passenger train working. — History and velopment of the International Sleeping Car Com- ny. (3 700 words & fig.)

1934 **385 (.44) & 656 .2 (.44)**
odern Transport, No. 804, August 11, p. 8.
Railway communications in France. — No. 1. The neral situation. — (2 200 words.)

1934 **385. (08 (.436)**
odern Transport, No. 804, August 11, p. 9.
STRAUSS (F.). — **Austrian Railways. — Ten years' velopments.** (800 words.)

1934 **656 .1 (.68)**
odern Transport, No. 805, August 18, p. 2.
Road transport in South Africa. (1 000 words.)

1934 **621 .132.3 (.42) & 621 .132.5 (.42)**
Modern Transport, No. 805, August 18, p. 3.
Mixed traffic locomotives for L. M. S. Ry. — **Two-cylinder 4-6-0 type** to constitute new series. (1 400 words & fig.)

1934 **625 .245**
Modern Transport, No. 805, August 18, p. 5.
200-ton all-steel bogie well wagon for the Soviet Government Railways. (500 words & fig.)

1934 **385 (.44) & 656 .2 (.44)**
Modern Transport, No. 805, August 18, p. 7.
Railways communications in France. No. 2. — **Road competition and technical progress.** (2 900 words.)

Railway Age. (New York.)

1934 **625 .245 (.73)**
Railway Age, No. 3, July 21, p. 63.
Kansas City Southern builds **automobile box cars.** (2 100 words & fig.)

1934 **624 (.73)**
Railway Age, No. 3, July 21, p. 67.
To build **long bridges** over Bonnet Carre floodway. (1 600 words & fig.)

1934 **656 .211 (.43) & 725 .31 (.43)**
Railway Age, No. 3, July 21, p. 92.
HOWARD (N. D.). — **Philadelphia improvements of the Pennsylvania near completion.** (12 000 words & fig.

1934 **625 .214**
Railway Age, No. 3, July 21, p. 113.
WALSH (W. F.) & SPENCER, Jr. (A. C.). — **Car journal lubrication problem.** (1 900 words & fig.)

1934 **656 .261 (.73)**
Railway Age, No. 3, July 21, p. 119.
Storedoor service increases traffic. (1 000 words & fig.)

1934 **656 .1 (.73)**
Railway Age, No. 3, July 21, p. 121.
Efficient utilization of coaches (1 300 words & fig.)

1934 **656 .212.6 (.73)**
Railway Age, No. 5, August 4, p. 136.
Kansas City Terminal completes large mail-handling plant. (3 800 words & fig.)

1934 **625 .245 & 656 .24**
Railway Age, No. 5, August 4, p. 141.
Damage from sweating of steel car roofs. (1 600 words & 1 table.)

1934 **385 .517.1 (.73)**
Railway Age, No. 5, August 4, p. 143.
U. S. may take over railroad **pension plans.** (6 000 words & 1 table.)

Railway Engineer. (London.)

1934 **625 .1 (0**
Railway Engineer, August, p. 231.
The railway highway. — A brief summary of the Permanent Way Institution Jubilee Address by Mr. Alexandre NEWLANDS. (2 700 words.)

1934 **621 .131.3 (.42) & 621 .132.3 (.42)**
Railway Engineer, August, p. 233.
« Cock o' the North ». — A new type of **three-cylinder 2-8-2 express passenger locomotive** introduced by the L. N. E. Ry., incorporates notable innovations. (3 400 words & fig.)

1934 **624. (0**
Railway Engineer, August, p. 244.
FREEMAN (R.). — **Long span bridges.** (3 500 words.)

1934 **625 .143.2 (.43)**
Railway Engineer, August, p. 247.
ALLEN (C. J.). — **The Maximilianshütte Martensitic.** (2 000 words & fig.)

1934 **656 .211.5 (.43)**
Railway Engineer, August, p. 250.
BONDY (O.). — **All-welded railway station roof structures.** (2 600 words & fig.)

1934 **621 .135.4**
Railway Engineer, August, p. 255.
PORTER (S. R. M.). — **The mechanics of a locomotive on curved track.** — II. (2 500 words & fig.)

1934 **621 .94 (.42)**
Railway Engineer, August, p. 258.
The latest type Asquith high production carriage and wagon **wheel turning lathe.** (900 words & fig.)

1934 **625 .216 (.42)**
Railway Engineer, August, p. 259.
The Gloucester fabricated **drawbar cradle.** (100 words, 2 tables & fig.)

Railway Engineering and Maintenance. (Chicago.)

1934 **625 .1 (.73) & 656 .284 (.73)**
Railway Engineering & Maintenance, August, p. 420.
Meeting nature at its worst. (3 400 words & fig.)

1934 **625 .142.2 & 625 .173**
Railway Engineering & Maintenance, August, p. 424.
MABILE (J. B.). — **When should a tie come out ?** (3 300 words & fig.)

1934 **624. (0 & 694**
Railway Engineering & Maintenance, August, p. 427.
NEWLIN (J. A.) & HECK (G. E.). — Tests show **strength of Douglas Fir stringers** after 23 years service. (1 500 words & fig.)

1934 **621 .392, 625 .15 & 625 .17**
Railway Engineering & Maintenance, August, p. 42
WISE (Ch.). — Your **welding.** — Are you getting t most of it ? (2 600 words & fig.)

1934 **621 .392 & 6**
Railway Engineering & Maintenance, August, p. 43
Electric-arc welding saves 40-year-old viaduct. (3 8 words & fig.)

Railway Gazette. (London.)

1934 **656. (.4**
Railway Gazette, No. 4, July 27, p. 139.
The **transport problem** in Northern Ireland. (4 8 words & fig.)

1934 **621 .135.2 & 625 .2**
Railway Gazette, No. 4, July 27, p. 144.
Locomotive and rolling stock bearings. (800 wor & fig.)

1934 **625 .232 (.4**
Railway Gazette, No. 4, July 27, p. 145.
More **tourist trains** for the L. N. E. Ry. (1 000 wor & fig.)

1934 **625 .232 (.4**
Railway Gazette, No. 4, July 27, p. 146.
New **main line coaching stock,** L. M. S. Ry. (1 2 words & fig.)

1934 **62. (01, 621 .39 & 625 .2**
Railway Gazette, No. 4, July 27, p. 148.
An improved **magnetic crack detector** for railw axles. (400 words & fig.)

1934 **621 .132.3 (.4**
Railway Gazette, No. 4, July 27, p. 149.
Rebuilt Paris-Orleans express locomotives for t **Nord.** (450 words & fig.)

1934 **625 .143.5 (.42) & 625 .172 (.4**
Railway Gazette, No. 5, August 3, p. 189.
New **rail creep** adjuster. (750 words & fig.)

1934 **656 .1 (.6**
Railway Gazette, No. 5, August 3, p. 193.
Road motor services in South Africa. (1 300 wor & fig.)

1934 **621 .132.8 (.4**
Railway Gazette, No. 5, August 3, p. 197.
Super-high-pressure steam railcars in Germany. (5 words & fig.)

1934 **627 (.4**
Railway Gazette, No. 6, August 10, p. 221.
The Hindenburg dam. (700 words & fig.)

1934 **625 .232 (.93**
Railway Gazette, No. 6, August 10, p. 223.
Modern New Zealand passenger stock. (500 wor & fig.)

1934 **621 .132.3 (.42) & 621 .132.5 (.42)**
ailway Gazette, No. 6, August 10, p. 227.
New 4-6-0 type mixed traffic locomotives, L. M. S.
y. (500 words & fig.)

1934 **621 .43 (.71)**
iesel Ry. Traction, p. 244, Supplt. to the Ry. Gazette, August 10.
Diesel vehicles of the Canadian National Railways. 00 words & fig.)

1934 **621 .335 (.71) & 621 .43 (.71)**
iesel Ry. Traction, p. 246, Supplt. to the Ry Gazette, August 10.
GAGE (R. G.). — **Oil-electric traction** on the Cana-an National Railways. (3 800 words & fig.)

1934 **621 .335 (.42) & 621 .43 (.42)**
iesel Ry. Traction, p. 255, Supplt. to the Ry. Gazette, August 10.
Diesel-worked passenger and goods service. (500 words fig.)

1934 **621 .335 (.81) & 621 .43 (.81)**
iesel Ry. Traction, p. 256, Supplt. to the Ry. Gazette, August 10.
Inauguration of Brazilian Diesel service. (800 words fig.)

1934 **621 .335 (.489) & 621 .43 (.489)**
iesel Ry. Traction, p. 259, Supplt. to the Ry. Gazette, August 10.
High speed trains for Denmark. (1 500 words & fig.)

1934 **621 .33 (.73)**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 162.
An up-to-date American electrified system. (2 300 ords & fig.)

1934 **621 .33 (.43)**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 168.
The position of electric traction in Germany. (1 800 ords & fig.)

1934 **621 .31**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 172.
Mercury arc rectifiers — V. (3 800 words & fig.)

1934 **621 .338 (.494)**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 177.
Fast railcars in Switzerland. (600 words & fig.)

1934 **621 .338 & 625 .214**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 178.
The cost factor in roller bearings. (800 words.)

1934 **621 .31 (.43)**
lectric Ry. Traction, Supplt. to the Ry. Gazette, July 27, p. 178.
Mercury vapour frequency converter. (500 words.)

Railway Mechanical Engineer. (Philadelphia.)

1934 **385. (061.3**
Railway Mechanical Engineer, July, p. 217.
Mechanical Division Committees of the A. R. A. — Report at Chicago meeting. — Automotive rolling stock. — Brakes and brake equipment. — Locomotive construction. — Couplers and draft gears. — Wheels. — Tank cars. — Lubrication of cars and locomotives. — Specifications for materials. — Automatic train-line connectors. — Car construction. — Tests of trucks and truck springs. — Electric rolling stock. — Locomotive and car lighting. — Arbitration committee report. — Prices for labor and materials. — Loading rules. (50 000 words & fig.)

1934 **625 .212 (.73)**
Railway Mechanical Engineer, July, p. 252.
Mounting **car wheels.** (2 100 words & fig.)

1934 **621 .138.5 (.73)**
Railway Mechanical Engineer, August 10, p. 267.
Progressive spot system on the Lehigh Valley. (3 800 words, tables & fig.)

1934 **621 .135.2 (.73)**
Railway Mechanical Engineer, August 10, p. 277.
TAYLOR (B. W.). — **Roller bearings** for main and side-rods on Delaware & Hudson locomotives. (2 800 words, tables & fig.)

1934 **656 .221**
Railway Mechanical Engineer, August 10, p. 283.
KLEMIN (A.). — Aerodynamics of the railway train. — Part I. **Wind-tunnel experimental methods.** (3 300 words & fig.)

1934 **621 .134.1 (.73)**
Railway Mechanical Engineer, August 10, p. 288.
Bethlehem **high-speed auxiliary locomotive.** (1 100 words & fig.)

1934 **625 .248 (.73)**
Railway Mechanical Engineer, August 10, p. 294.
TOMPKINS (C. S.). — **Cleaning cars by the scrubbing method.** (3 400 words & fig.)

Railway Magazine. (London.)

1934 **656 .222.1 (.43)**
Railway Magazine, August, p. 79.
Modern **locomotive performance** in Germany. (2 400 words, 1 table & fig.)

1934 **656 .222.1**
Railway Magazine, August, p. 83.
Lord MONKSWELL. — **Train timing and the ways of stop watches.** (1 400 words.)

1934 **621 .131.2**
Railway Magazine, August, p. 85.
RICHARDSON (E. G.). — **The stream-lined locomotive.** (900 words & fig.)

1934 **656 .222.1 (.42)**
Railway Magazine, August, p. 89.
ALLEN (C. J.). — **British locomotive practice and performance.** (3 700 words & fig.)

Railway Signaling. (Chicago.)

1934 **656 .258 (.73) & 656 .259 (.73)**
Railway Signaling, August, p. 391.
Chesapeake & Ohio combines two interlockings in centralized-control. (2 600 words & fig.)

1934 **656 .258 (.73)**
Railway Signaling, August, p. 393.
Electric interlocking on the Baltimore & Ohio. (1 100 words & fig.)

1934 **656 .25**
Railway Signaling, August, p. 395.
The effect of magnetized wheels on train control. (4 000 words & fig.)

1934 **656 .259 (.73)**
Railway Signaling, August, p. 399.
Spring-derail for drawbridge protection. (600 words & fig.)

1934 **656 .254 (.73) & 656 .258 (.73)**
Railway Signaling, August, p. 400.
Remote-control replaces mechanical interlocking on Canadian Pacific. (2 000 words & fig.)

1934 **656 .25 (0**
Railway Signaling, August, p. 403.
WYANT (L.). — Observance of **signal indications** how secured. (1 200 words.)

The Locomotive. (London.)

1934 **385 .4, 621 .138 & 656 .22**
The Locomotive, August 15, p. 231.
The relation of the locomotive department to the railway organisation as a whole. (1 000 words.)

1934 **621 .131.2**
The Locomotive, August 15, p. 232.
PHILLIPSON (E. A.). — **Steam locomotive design : data and formulæ. — Chapter XII. Main frames : Loads and forces.** (2 500 words & fig.)

1934 **621 .43 (.42)**
The Locomotive, August 15, p. 242.
300 h.-p. oil-electric locomotive at work on the L. M. & S. Ry. (1 400 words & fig.)

1934 **621 .132.8 (.44)**
The Locomotive, August 15, p. 244.
A « stream-line » locomotive of thirty years ago. (1 700 words & fig.)

1934 **621 .133.**
The Locomotive, August 15, p. 246.
BREWER (F. W.). — **Locomotive regulators.** — Some early and modern types. (2 800 words.)

1934 **621 .33**
The Locomotive, August 15, p. 249.
Electric locomotive design : VIII. — Individual axl drives. (700 words & fig.)

1934 **621 .335 (.43**
The Locomotive, August 15, p. 251.
German State Ry. Co., **Bo-Bo type electric passenge and goods locomotives.** (2 200 words & fig.)

1934 **621 .43 (.41**
The Locomotive, August 15, p. 257.
74 h.-p. Diesel-railcar, County Donegal Rys. (5(words & fig.)

1934 **621 .392 & 621 .138**
The Locomotive, August 15, p. 258.
Notes on **welding** in locomotive workshops. (2 8(words & fig.)

Transit Journal. (New York.)

1934 **659 (.7**
Transit Journal, July, p. 210.
Salesmanship increase riding 58 per cent. (1 800 wor & fig.)

1934 **621 .338 (.73) & 625 .235 (.7**
Transit Journal, July, p. 216.
First light-weight « L » train placed in service. (2 8(words & fig.)

In Spanish.

Anales de la Asociación de Antiguos Alumnos del I. C. A. I. (Madrid.)

1934 **62. (01 & 6(**
Anales de la Asociación de Antiguos Alumnos d I.C.A.I., julio, p. 359.
NAVARRETE Y DEL SOLAR (R.) & ESTEBAN (M. R.). — **Los rayos X como método de investigaci industrial.** (Conclusión.) (1 700 palabras & fig.)

1934 **621 .335 (.46**
Anales de la Asociación de Antiguos Alumnos d I.C.A.I., julio, p. 369.
JACKSON (L.) & LLANOS (S.). — **Locomotor eléctricas de la Compañía de los Caminos de Hier** del Norte de España. (3 600 palabras & fig.) (Con nuará.)

1934 **621 .33 (.4**
Anales de la Asociación de Antiguos Alumnos d I.C.A.I., julio, p. 378.
La **electrificación** de los ferrocarriles en Italia. (C clusión.) (6 500 palabras & fig.)

Caminos de hierro. (Madrid.)

1934 **385**

aminos de hierro, julio, p. 180.

MONREAL (M.) & CASTILLO (M.). — La crisis **:rroviaria** y sus posibles remedios. VI : Transportes **1** gran velocidad. (1 600 palabras & fig.)

Ferrocarriles y Tranvias. (Madrid.)

1934 **621 .43**

errocarriles y Tranvias, julio, p. 258.

BRAVO (J. A.). — La aplicación de los **motores** iesel a la tracción ferroviaria. (4 800 palabras.)

1934 **621 .43 (.492)**

errocarriles y Tranvias, julio, p. 263.

Los nuevos **automotores Diesel-eléctricos** de Holanda. 700 palabras & fig.)

1934 **621 .33 (.47)**

errocarriles y Tranvias, agosto, p. 292.

CHAPULI (J. R.). — La **electrificación** de ferro-rriles en Rusia. (1 900 palabras & 4 cuadros.)

1934 **656 .254**

errocarriles y Tranvias, agosto, p. 299.

MORENO (R. S.). — El problema de los **pasos a** ivel. (8 000 palabras & fig.)

1934 **656 .1 & 656 .2**

errocarriles y Tranvias, agosto, p. 308.

Legislación vigente en los principales países, en ma-eria de **coordinación** entre el ferrocarril y el automóvil. 5 000 palabras.) (Continuará.)

Ingenieria y Construcción. (Madrid.)

1934 **624 .63 (.460)**

ngenieria y Construcción, agosto, p. 481.

BURGUERA (J.). — **Puente** de Aragón sobre el río Turia, en Valencia. (3 900 palabras & fig.) (Continuará.)

1934 **385 .113 (.460)**

ngenieria y Construcción, agosto, p. 503.

La **memoria anual** de las Compañías del Norte y Madrid-Zaragoza-Alicante. (3 600 palabras.)

1934 **385 (.460)**

ngenieria y Construcción, agosto, p. 506.

Proyecto de ley de bases de **ordenación ferroviaria** n España. (6 100 palabras.)

Los Transportes. (Madrid.)

1934 **656 .23 (0**

os Transportes, n° 381, 1 de agosto, p. 231.

MERINO (J.). — **Teorética del tráfico.** (2 400 pala-ras.)

Revista de Ingenieria Industrial. (Madrid.)

1934 **621 .43**

Revista de Ingenieria Industrial, agosto, p. 256.

BRAVO (J. A.). — La aplicación del **motor Diesel** a la tracción ferroviaria. (3 300 palabras & fig.)

In Italian.

La tecnica professionale. (Firenze.)

1934 **625 .23 (.45)**

La tecnica professionale, luglio, p. 173.

PEDEMONTI (G.). — **Carrozze a cassa metallica** tipo 1931 delle Ferrovie dello Stato italiano. (2 200 parole & fig.)

1934 **621 .33**

La tecnica professionale, luglio, p. 183.

SAVOLA (A.). —Chiarimenti sulla **velocitá dei treni elettrici trifasi.** (2 300 parole.)

1934 **621 .13 & 621 .33**

La tecnica professionale, luglio, p. 185.

RISSONE (S.). — **Problemi ferroviari** alla Sessione Scandinava 1933 della Conferenza mondiale dell' energia. (3 500 parole & fig.)

1934 **621 .335 (.45)**

La tecnica professionale, agosto, p. 209.

GIANAZZI. — **Ingranaggi delle locomotive elettriche** a C. C. E626. (2 000 parole & fig.)

L'Ingegnere. (Roma.)

1934 **624. (0 & 669**

L'Ingegnere, n° 15, 1 agosto, p. 772.

CAMILLI (D.). — **L'alluminio nella costruzione dei ponti.** (900 parole & fig.)

1934 **625 .1 (.45)**

L'Ingegnere, n° 16, 16 agosto, p. 802.

MARTINO (V. de). — La **direttissima** Firenze-Bologna. (9 300 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1934 **656 .212.5**

Rivista tecnica delle ferrovie italiane, n° 1, 15 luglio, p. 1.

PALMIERI (G. C.) & DORATI (S.). — Uno sguardo allo stato attuale della tecnica delle **grandi stazioni di smistamento.** (11 000 parole & fig.)

1934 **621 .131**

Rivista tecnica delle ferrovie italiane, n° 1, 15 luglio, p. 28.

BAJOCCHI (U.). — Sulla determinazione della pressione media indicata nelle **locomotive a semplice espansione.** (5 400 parole, 13 quadri & fig.)

1934 **621 .336**

Rivista tecnica delle ferrovie italiane. n° 1, 15 luglio, p. 52.

PAGANI (D.). — Un nuovo tipo di **presa di corrente** a carrucola con attacco elastico. (2 700 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **669 & 721 .9**

De Ingenieur, Nr 31, 3 Augustus, p. Bt. 67.

DEKKER (F. W.). — Gewrongen **betonconstructies.** (3 100 woorden & fig.)

1934 **625 .215**

De Ingenieur, Nr 31, 3 Augustus, p. V. 61.

BRUNNER (H.). — Het drie-assige **electrische motorrijtuig met zich in de bochten radiaal instellende assen** van de Limburgsche Tramweg-Mij. (3 000 woorden & fig.)

1934 **62. (01**

De Ingenieur, Nr 32. 10 Augustus, p. A. 297.

DRIESSEN (G.). — Voortzetting van **knikproeven** van constructies van samengestelde doorsnede met geringe slankheid. (1 800 woorden, 1 tabel & fig.)

1934 **721 .4**

De Ingenieur, Nr 32, 10 Augustus, p. B. 115.

OP DEN OORDT (J. H.). — Onderzoek van **gewelven.** (900 woorden.)

1934 **625 .2 (0**

De Ingenieur, Nr 33, 17 Augustus, p. A. 309.

van DIJK (E.). — « **All-steel-cars** ». (1 200 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1934 **624 .32 (.492)**

Spoor- en Tramwegen, Nr 16, 31 Juli, p. 425.

FOEST (A. H.). — De nieuwe **brug** over de Waal in het 2e hoofdspoor Zaltbommel-Waardenburg. (1 600 woorden & fig.)

1934 **621 .33 (.492)**

Spoor- en Tramwegen, Nr 16, 31 Juli, p. 429.

VAN LESSEN (J.). — **Electrificatie** Rotterdam-Dordrecht. De electrotechnische werkzaamheden. (1 600 woorden & fig.) (Slot.)

1934 **621 .33 (.492)**

Spoor- en Tramwegen, Nr 17, 14 Augustus, p. 445.

VAN KATWIJK (C. J. J.). — De **electrificatie** van het baanvak Schiedam-Hoek van Holland. (2 000 woorden & fig.)

1934 **656 .254 (.494)**

Spoor- en Tramwegen, Nr 17, 14 Augustus, p. 459.

De S. B. B. voeren de **automatische beheersching** van treinen in. (1 800 woorden & fig.)

In Polish.

(= 91.885)

Inżynier Kolejowy. (Warszawa.)

1933 **621 .33 (.438) = 91 .8**

Inzynier Kolejowy, No. 7, p. 164.

BRASKI-KASYNA (J.). — History and evolution electric traction and future prospects for electrificati of the main lines of the Polish State Railways (cc cluded). (4 200 words & fig.)

1933 **656 .1 (.438) = 91 .8**
& 656 .2 (.438) = 91 .8

Inzynier Kolejowy, No. 9, p. 205.

DOBIECKI (A.). — **Rail and road transport cor petition** in Poland. (1 400 words.)

1933 **656 .1 (.438) = 91 .8**
& 656 .2 (.438) = 91 .8

Inzynier Kolejowy, No. 9, p. 217.

TUZ (A.). — **Technical improvements** carried o on the Polish Railways **for combating road motor cor petition.** (3 000 words.)

1933 **656 (.438) = 91 .8**

Inzynier Kolejowy, No. 9, p. 232.

WASIUTYNSKI (A.). — **Rail and road co-ordinati** on the Polish Railways. (4 200 words.)

1933 **621 .134.2 = 91 .8**

Inzynier Kolejowy, No. 10, p. 245.

MADEYSKI (J.). — Effect of slide valve design **operating economies and locomotive maintenance.** (4 2 words. 1 table & fig.)

1933 **624 .2 = 91 .8**

Inzynier Kolejowy, No. 12, p. 294.

CHMIELOWIEC (A.). — Permissible stresses in m **tal railway bridges.** (3 000 words & 5 tables.)

1933 **621 .138.3 = 91 .8**

Inzynier Kolejowy, N. 12, p. 299.

KLOCZKOWSKI (W.). — Principles for the desi of **boiler cleaning plants** in modern depots. (4 2 words & fig.)

1934 **621 .33 (.438) = 91 .8**

Inzynier Kolejowy, No. 7, p. 167. No. 8, p. 182.

The railway **electrification** problem in Poland. (7 words.)

1934 **385 .56 = 91 .8**

Inzynier Kolejowy, No. 8, p. 173.

MANTEUFFEL (L.). — The railways and the u **employment problem.** (1 500 words.)

1934 **625 .113 = 91 .8**

Inzynier Kolejowy, No. 8, p. 174.

JESIONEK (J.). — Devices for preventing cu **deformation in railway track.** (3 000 words & fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1934 **385.** (.09 (.68)

zeta dos caminhos de ferro, N° 1119, 1 de agosto, p. 389.

GALVÃO (J. A. L.). — A união Sul Africana e os seus **caminhos de ferro.** (4 800 palavras & fig.) (Continúa.)

Revista das Estradas de ferro. (Rio de Janeiro.)

1934 **621** .43 (.81)

Revista das Estrada de ferro, N°. 215, 30 de junho, p. 516.

Inauguração do trem « Cometa ». (2 000 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

NOVEMBER (1934)

[016. 385. (02]

I. — BOOKS.

In French.

1934 656 (.64)
)USSER.
Le problème des transports au Maroc.
Paris, Librairie du Recueil Sirey, 22, rue Soufflot. volume (16×25), 265 pages. (Prix: 40 fr. français.)

1934 385. (01 (.67)
)NDEVEAUX (L.).
Le Chemin de fer Congo-Océan.
Paris, Revue Science et Industrie, 29, rue de Berri. volume. (Prix: 10 fr. français.)

In German.

1934 624 .5
)HNY (C.).
Hängebrücken. Beitrage zu ihrer Berechnung und onstruktion.
Berlin, Wilhelm Ernst und Sohn. 1 Band. (Preis: R.M.)

1934 385 .6
RIEBE (K.).
Die neuen Übereinkommen über den internationalen isenbahnverkehr.
Berlin, Julius Springer. 1 Band. (Preis : 4.80 R.M.)

1934 656 .1 (.42 + .73) & 656 .2 (.43 + .72)
'ALLWASS (A.).
Der Wettbewerb zwischen Eisenbahn und Kraftwa- n im deutschen Güterverkehr unter Berücksichtigung r Verhältnisse in England und in den Vereinigten aaten von Amerika.
Bamberg, Universitätsverlag Ratsbuchhandlung. Band.

1934 624 .32 (.43) & 624 .62 (.43)
ARIG.
Neuere Stahlbrücken der Deutschen Reichsbahn.
Berlin, Wilhelm Ernst und Sohn. 1 Band. (Preis: 70 R.M.)

1934 656 .235
RIEDEL (Ph.).
Neuzeitliche Organisation im Eisenbahn-Güterverkehr.
Berlin, Verlag für Organisations-Schriften, G.m.b.H. 1 Band, 52 Seiten mit 28 Abbildungen. (Preis: 8.75 R.M.)

1934 621 .131.2 (.43)
Toleranzvorschriften für die Dampflokomotiven der Deutschen Reichsbahn.
Berlin (N.W.7), Deutsche Lokomotivbau-Vereinigung, Hermann-Göring Strasse, 24, und Berlin (S. W. 19), Beuth-Verlag, Dresdener Strasse, 97. 1 Band.

1934 385 .1 (.43)
Wirtschaftsführung und Finanzwesen der Deutschen Reichsbahn.
Berlin, Verkehrswissenschaftliche Lehrmittelgesellschaft m.b.H. bei der Deutschen Gesellschaft. 1 Band, 283 Seiten und Abbildungen.

In English.

1934 621 .1 (02
BARNARD (W. N.), ELLENWOOD (F. O.) & HIRSCHFIELD (C. F.).
Elements of heat power engineering. Part II. Steam generating apparatus and prime movers, fuels, combustion and heat transmission. Part III. Auxiliary equipment, plant ensemble, air conditioning and refrigeration.
New York, J. Wiley and Sons, Inc. London, Chapman and Hall, Ltd. (Price: Part II: 34 sh. net; Part III: 28 sh. net.)

1934 55. (06 (.52)
Bulletin of the Geotechnical Committee of the Japanese Government Railways, No. 3, July 1934.
Tokyo. Research Office, Government Railways of Japan (8 1/4 × 11 3/4 inches), 209 pages, illust.

1934 385. (04 (.52)
GOVERNMENT OF JAPAN. DEPARTMENT OF RAILWAYS.
Annual report for the year ending March 31st, 1933.
Tokyo. Published by the Department of Railways. 302 pages, tables, fig. and a map.

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress conjointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509).

1934 669 .1
GREGG (J. L.).
The alloys of iron and molybdenum.
New York and London, Messrs. McGraw-Hill Publishing Co. Ltd. (Price: 36 sh. net.)

1934 656 (.54)
GUHA (S. K.).
Problems of transport co-ordination in India.
London, E.C.4 Humphrey Milford, at the Oxford University Press, Amen House, Warwick Square. — Bombay, Humphrey Milford, at the Oxford University Press, B. I. Building, Nicol Road (5 × 7 1/4 inches), 77 pages. (Price: 1 Rupee.)

1934 621 .13 (02
Locomotive Engineers' Pocket Book, 1934.
London, E.C.4. The Locomotive Publishing Co. Ltd., 3, Amen Corner, Paternoster Row. (6 1/2 × 4 × 1 inches), 384 pages. (Price : 3 sh. 6 d.)

1934 656 .1 (.68)
UNION OF SOUTH AFRICA.
Report of the Central road transportation board for the year ended 31st March, 1934.
Pretoria. The Government Printer. 35 pages. (Price: 1 sh. 6 d.)

In Spanish.

1934 385 (.460) & 656 (.46
COMPANIAS DE LOS FERROCARRILES DEL NOR DE ESPANA Y DE MADRID A ZARAGOZA A ALICANTE.
Informe sobre el proyecto de ley de ordenación fer viaria leído en las Cortes el 21 de junio de 1934.
Madrid, publicado por las dichas Compañías. 1 vo men, 144 páginas y cuadros.

1934 385 (.8
SIMONS (Dr. H.).
El ferrocarril a Bolivia.
Buenos Aires, Liberia y Casa de Jesus Menen Bernardo de Irigoyen, 186. 1 volumen, 240 página

In Italian.

1934 656 .1 & 656
CAPACCIOLI (Q.).
Chi vincerá ? Discussioni sulla concorrenza fra F rovia e Automobile.
Firenze, Stabilimento Grafico Commerciale. 1 volu 128 pagine. (Prezzo: 7 Lire.)

[016. 385 (05]

II. — PERIODICALS.

In French.

Annales des travaux publics de Belgique. (Bruxelles.)

1934 624 .63 (.493)
Ann. des travaux publics de Belgique, août, p. 597.
DECLERCQ (J.) & SANTILMAN (H.N.F.). — Le nouveau **pont** de Vroenhoven sur le canal Albert. (6 700 mots et fig.)

Bulletin de la Société alsacienne de constructions mécaniques. (Paris.)

1934 621 .132.3 (.59)
Bull. de la Sté alsacienne de Const. méc., juillet, p. 45.
GILLIOT (H.). — **Locomotive « Pacific » à voie de 1 mètre** des Chemins de fer de l'Indochine (Réseaux Nord et Sud). (900 mots et fig.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1934 385 .63 & 656 .223.2
Bull. des transp. intern. par ch. de fer, août, p. 403, septembre, p. 443.
PETRORO (L.). — La **réglementation juridique internationale de transport des wagons de particuliers.** (5 500 mots.)

1934 313 .385 (.4
Bull. des transp. intern. par ch. de fer, septem p. 436.
Résultats d'exploitation des chemins de fer no giens durant l'exercice 1932-33. (300 mots.)

1934 385. (09.1 (.496 + .
Bull. des transp. intern. par ch. de fer, septem p. 465.
Le **développement** des chemins de fer dans la N velle Turquie. (1 900 mots.)

1934 313 .385 (.4
Bull. des transp. intern. par ch. de fer, septem p. 473.
Statistique des Chemins de fer néerlandais l'année 1933. (800 mots.)

Bulletin technique de la Suisse romande. (Ve

1934 624
Bull. tech. de la Suisse romande, n° 18, 1er septe p. 206.
Etude d'un cas concret de **poteaux d'une construc à ossature métallique.** (2 600 mots et fig.)

1934 625 .5 (
Bull. tech. de la Suisse romande, n° 19, 15 septe p. 217.
MARTHALER (C. R.). — Le **chemin de fer fu laire** du « Monserrate » à Bogota (Colombie). mots et fig.)

Chronique des transports. (Paris.)

1934 **656 .1 (.44) & 656 .2 (.44)**

hronique des transports, n° 16, 26 août, p. 2.

La **coordination du Rail et de la Route.** L'accord e Beauvais. (6 000 mots.)

1934 **621 .43 (.44)**

hronique des transports, n° 16, 26 août, p. 11.

Le développement des **automotrices** en France. (700 ots et 1 carte.)

1934 **656 .235 (.44)**

hronique des transports, n° 17, 10 septembre, p. 3.

Tarifs de transport et vie chère. (2 000 mots.)

Génie civil. (Paris.)

1934 **669 .1**

énie civil, n° 2716, 1er septembre, p. 185; n° 2717, 8 septembre, p. 208.

PERSOZ (L.). — Les **aciers spéciaux.** Classification emplois. Influence des éléments additionnels. (12 100 ots et fig.)

1934 **531**

énie civil, n° 2716, 1er septembre, p. 190.

ANTONI (A.). — **L'équilibrage des pièces tournantes** les machines à équilibrer. (3 700 mots et fig.) (suite fin).

1934 **624 .63 (.44)**

énie civil, n° 2716, 1er septembre, p. 193.

SECKLER (G.). — **Pont-route en béton armé** sur ligne de Reding à Igney-Avricourt, sur le réseau Alsace et de Lorraine. (2 400 mots et fig.)

1934 **621 .43 (.44)**

énie civil, n° 2718, 15 septembre, p. 229.

Les **rames automotrices rapides Diesel-électriques** de Compagnie du Nord. (3 800 mots et fig.)

1934 **621 .392 & 665 .882**

énie civil, n° 2718, 15 septembre, p. 232.

PIGEAUD (G.). — Réflexions sur l'emploi de la **udure** dans les constructions métalliques. (3 800 mots.) A suivre.)

La Traction électrique. (Paris.)

1934 **621 .33 & 621 .34**

a Traction Electrique, juin, p. 107.

HUG (Ad. M.). — **Traction par accumulateurs.** 4 800 mots et fig.)

1934 **621 .43 (.44)**

a Traction Electrique, août, p. 148.

Les **trains Diesel-électriques** à grande vitesse du nemin de fer du Nord français. (900 mots et fig.)

1934 **625 .5 (.494)**

a Traction Electrique, août, p. 151.

HUNZIKER (F.). — Le développement des **chemins fer funiculaires suisses**, particulièrement de la Suisse ntrale. (2 000 mots et fig.)

Les transports modernes. (Paris.)

1934 **625 .251**

Les transports modernes, juillet-août, p. 44.

Freinage automatique des wagons chargés. (3 000 mots et fig.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1934 **625 .143.3**

L'Ind. des voies ferrées et des transp. autom., août, p. 212.

VINCENT. — Utilisation de la **voiture détectrice Sperry** pour déceler les défauts internes des rails. (2 500 mots et fig.)

1934 **621 .43**

L'Ind. des voies ferrées et des transp. autom., août, p. 216.

MARTIN (J.). — **Les moteurs de traction à injection.** (3 300 mots et fig.) (A suivre.)

1934 **625 .62 (.44)**

L'Ind. des voies ferrées et des transp. autom., août, p. 385.

PETIT-BOIS (H.). — Note sur la **transformation d'une motrice** dans le but d'augmenter le confort, la sécurité, la vitesse et de diminuer les dépenses d'exploitation. (2 800 mots et fig.)

L'Ingénieur-Constructeur. (Paris.)

1934 **62. (01**

L'Ingénieur-Constructeur. juillet-août, p. 3009.

ISNARD (E.). — **Résistance des matériaux. Arcs paraboliques** encastrés à section constante. (4 200 mots et fig.)

L'Ossature métallique. (Bruxelles.)

1934 **624 .32 (.493) & 621 .392 (.493)**

L'Ossature métallique, septembre, p. 407.

SPOLIANSKY (A.). — Le **pont « C »** d'Hérenthals sur le canal Albert. Le premier pont entièrement soudé construit en Belgique. (1 500 mots et fig.)

1934 **624 .32 (.493)**

L'Ossature métallique, septembre, p. 414.

BRAECKMAN (A.) & VAN GAVER (A.). — Les **ponts** de Schooten sur le canal Albert. (1 600 mots et fig.)

1934 **624 .2**

L'Ossature métallique, septembre, p. 445.

VERDEYEN (J.). — Application de la plasticité au calcul des **systèmes hyperstatiques.** (3 400 mots et fig.)

Revue générale des chemins de fer. (Paris.)

1934 **621 .33 (.65)**

Revue générale des chemins de fer, septembre, p. 151.

DELPY. — Résultats techniques et économiques de l'électrification de la ligne de Bône à Oued-Keberit des Chemins de fer algériens de l'Etat. (2 800 mots et fig.)

1934 **385 .113 (.44)**

Revue générale des chemins de fer, septembre, p. 157.

Les résultats de l'exploitation des Grands Réseaux de chemins de fer français. (31 500 mots et fig.)

1934 **625 .1 (.44)**

Revue générale des chemins de fer, septembre, p. 219.

Participation des réseaux de chemins de fer français à l'exécution des grands travaux contre le chômage. (6 000 mots.)

Revue politique et parlementaire. (Paris.)

1934 **385 .4 (.44), 656 .1 (.44) & 656 .2 (.44)**

Revue politique et parlementaire, 10 septembre, p. 434.

PESCHAUD (M.). — La restauration des chemins de fer et la coordination des transports. III. La situation financière des réseaux et les mesures prises en 1934 pour y remédier. (8 000 mots.) (A suivre.)

Revue universelle des Mines. (Liége.)

1934 **624 .63 (.493)**

Revue universelle des mines, n° 18, 15 septembre, p. 481.

DANIEL (R.). — Les cintres métalliques des arcs en béton armé du grand hall de l'Exposition de Bruxelles 1935. (3 800 mots et fig.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

1934 **385 .62 & 385 .63**

Archiv für Eisenbahnwesen, Heft 3, Mai-Juni, S. 477.

FRIEBE. — Die neuen Übereinkommen über den internationalen Eisenbahnverkehr. (14 500 Wörter.)

1934 **385 .1 (.71)**

Archiv für Eisenbahnwesen, Heft 3, Mai-Juni, S. 517.

VOIGT (G.). — Canada's Eisenbahnen in der Weltkrise. (12 000 Wörter.)

1934 **385 .113 (.489)**

Archiv für Eisenbahnwesen, Heft 3, Mai-Juni, S. 637.

THOMSEN. — Die Eisenbahnen in Dänemark in den Betriebsjahren 1930-31, 1931-32 und 1932-33. (2 200 Wörter.)

1934 **313 .385 (.485)**

Archiv für Eisenbahnwesen, Heft 3, Mai-Juni, S. 649.

THOMSON. — Das schwedische Eisenbahnnetz 1930, 1931 und 1932. (3 300 Wörter.)

1934 **385 .113 (.725**

Archiv für Eisenbahnwesen, Heft 3, Mai-Juni, S. 69

Die Mexikanischen Nationaleisenbahnen im Kale derjahr 1931. (2 300 Wörter.)

1934 **385 .**

Archiv für Eisenbahnwesen, Juli-August, S. 843.

FRIEBE. — Die neuen Übereinkommen über de internationalen Eisenbahnverkehr. — Zweiter Teil: Die Anlagen zum Internationalen Übereinkommen üb den Eisenbahnfrachtverkehr (I.U.G.). (10 200 Wörter

---

1934 **656 .1 (.73**

Archiv für Eisenbahnwesen, Juli-August, S. 871.

MERKERT (E.). — Das « Bureau of Railway Econo mics » über den Kraftwagenverkehr in Amerika. (4 8 Wörter.)

1934 **385 .113 (.438**

Archiv für Eisenbahnwesen, Juli-August, S. 913.

WYSZOMIRSKI (K.). — Die Polnischen Staat bahnen im Jahr 1931. (8 400 Wörter.)

1934 **385 .113 (.492**

Archiv für Eisenbahnwesen, Juli-August, S. 937.

Die Niederländischen Eisenbahnen im Jahr 193 (5 700 Wörter.)

Elektrische Bahnen. (Berlin.)

1934 **621 .335 (.43**

Elektrische Bahnen, Heft 8, August, S. 169.

KLEINOW (W.). — 1 Do 1-Reichsbahn-Schnellzu lokomotive für 140 km/h., Reihe E 18. (1 000 Wört und Abb.)

1934 **621 .33 (.43**

Elektrische Bahnen, Heft 8, August, S. 171.

BRETSCHNEIDER. — Ein neuer selbstfahrend Fahrleitungsuntersuchungswagen der Deutschen Reich bahn. (3 200 Wörter und Abb.)

Glasers Annalen. (Berlin.)

1934 **621 .**

Glasers Annalen, Heft 4, 15. August, S. 25.

KINKELDEI (L.). — Berechnung der Anfahrbeschle nigung und der Anfahrleistung von Dieseltriebwage (5 300 Wörter und Abb.)

Organ für die Fortschritte des Eisenbahnwesen (Berlin.)

1934 **656 .212**

Organ für die Fortschritte des Eisenbahnwesens, H 17, 1. September, S. 316.

MÜLLER (W.). — Neuere Methoden zur betrieb technischen Untersuchung der Ablaufanlage eines V schiebebahnhofs. (7 800 Wörter und Abb.)

1934 **625 .142.2 & 691**

gan für die Fortschritte des Eisenbahnwesens. Heft 17, 1. September, S. 329.

NOWAK (A.). — Die Verwendung von Mineralölen r **Holzimprägnierung.** (1 400 Wörter.)

1934 **621 .43**

gan für die Fortschritte des Eisenbahnwesens, Heft 18; 15. September; S. 331.

KURT (F.). — Abnahmefahrten mit **dieselelektrischen** iebwagen. (3 700 Wörter und Abb.)

1934 **625 .143.1**

gan für die Fortschritte des Eisenbahnwesens Heft 18, 15. September, S. 336.

HEUMANN. — Zur Frage des **Radreifenumrisses.** 500 Wörter und Abb.)

1934 **621 .87 (.73)**

gan für die Fortschritte des Eisenbahnwesens Heft 18, 15. September, S. 342.

Aufgleisungskräne der « Cleveland Union Terminals ompany » und der « New York Central » Eisenbahn. 200 Wörter und Abb.)

1934 **625 .212**

rgan für die Fortschritte des Eisenbahnwesens, Heft 18; 15. September; S. 347.

Verwendung von Gummi für die **Räder von Schienen-**ahrzeugen. (700 Wörter und Abb.)

---

eitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 **691**

eitsch. des Ver. deutsch. Ing. Nr. 35, 1. September, S. 1037.

GRAF (O.) & WALZ (K.). — **Rüttelbeton.** Unterchungen über das Verdichten des Betons durch Rütln. (3 400 Wörter und Abb.)

1934 **62. (01**

eitsch. des Ver. deutsch. Ing. Nr. 35, 1. September, S. 1045.

DANNENBERG (J.). — Zur internationalen Norung der kleinen **Kerbschlagprobe.** (1 200 Wörter und Tafeln.)

1934 **651**

eitsch. des Ver. deutsch. Ing. Nr. 36, 8. September, S. 1049.

KNIEHAHN (W.). — Die Bedeutung der **Büroma**chinen-Industrie. (3 000 Wörter.)

1934 **621 .43**

eitsch. des Ver. deutsch. Ing. Nr. 36, 8. September, S. 1065.

DAEVES (K.), KAMP (E.) & HOLTHAUS (K.). — ur Entstehung der Brüche an wassergekühlten Kolenstangen von **Dieselmotoren.** (2 400 Wörter und Abb.)

1934 **621 .43**

eitsch. des Ver. deutsch. Ing., Nr. 37, 15. September, S. 1088.

FINSTERWALDER (A.) & BREDENBREUKER (F.). Eignung der **Diesellokomotive** mit unmittelbarem ntrieb für Schnellfahrten. (1 600 Wörter und Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 **656 .254 (.43)**

Zeitsch. für das gesamt Eisenb.-Sicherungsw., Nr. 12, 10. September, S. 145.

KRAUSKOPF. — Die **elektromagnetische (induktive) Zugbeeinflussung** bei der Deutschen Reichsbahn. (4 300 Wörter und Abb.)

Zeitung des Vereins Mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 **656 .222.5**

Zeitung des Vereins mitteleurop. Eisenbahnverw., Nr. 35, 30. August, S. 611.

BORMANN (A.). — Die **Fremdenverkehrsbilanzen** Deutschlands und anderer wichtiger Reiseländer. (900 Wörter und 2 Tafeln.)

1934 **656 .254**

Zeitung des Vereins mitteleurop. Eisenbahnverw. Nr. 36, 6. September, S. 625.

FRIES. — Müssen verkehrsarme, aber unübersichtliche **Wegübergänge** bei Nebenbahnen bewacht werden? (1 200 Wörter.)

1934 **656 .28**

Zeitung des Vereins mitteleurop. Eisenbahnverw. Nr. 36, 6. September, S. 627.

MARTENS (A.). — Gefährliche Misshandlungen. Ein neuer Weg zur **Unfallbekämpfung.** (1 900 Wörter.)

1934 **621 .133.1 (.43)**

Zeitung des Vereins mitteleurop. Eisenbahnverw. Nr. 37, 13. September, S. 641.

VELTE. — Neuere Ergebnisse der **Brennstoffuntersuchungen** bei der Deutschen Reichsbahn. (5 500 Wörter und Abb.)

1934 **385 .52 (.43)**

Zeitung des Vereins mitteleurop. Eisenbahnverw. Nr. 38, 20. September, S. 661.

HIRSCH. — Die neuen **Lohnbedingungen** der Reichsbahnarbeiter. (5 000 (Wörter.)

In English.

Bulletin, American Railway Engineering Association. (Chicago, Ill.)

1934

Bull., Amer. Ry. Engineering Ass., June, p. 1.

LEFFLER (B. R.). — The new **impact formulas** of Committee XV. (3 300 words, 5 tables and fig.)

1934 **313 : 625 .173 (.73) & 625 .142 (.73)**

Bull. Amer. Ry. Engineering Ass., June, p. 15.

Preliminary report of Committee III. — Ties. — **Tie renewal statistics** for 1933.

1934 **385. (072 (.73)**
Bull., Amer. Ry. Engineering Ass., June, p. 17.
POTTER (Dr. A. A.). — **Research as applied to railroading.** (2 400 words.)

1934 **625 .14 (01**
Bull., Amer. Ry. Engineering Ass., June, p. 23.
TALBOT (Dr. A. N.). — Discussion on **stresses** in railroad track. (3 800 words and fig.)

1934 **625 .143.5 (.73)**
Bull., Amer. Ry. Engineering Ass., June, p. 31.
TALBOT (Dr. A. N.). — Discussion on design of **tie plates.** (1 600 words.)

Engineer. (London.)

1934 **621 .115**
Engineer, No. 4102, August, 24, p. 178; No. 4103, August, 31, p. 215.
The **surface condenser.** (6 000 words and 2 tables.) (To be continued.)

1934 **627 (.42) & 656 .213 (.42)**
Engineer, No. 4102, August, 24, p. 179.
Cherbourg Harbour works. (2 400 words and fig.)

1934 **62. (01**
Engineer, No. 4102, August, 24, p. 183.
MORRISON (J.L.M.). — **The influence of rate of strain in tension tests.** (3 400 words, 2 tables and fig.)

1934 **656 .28 (01 (.42)**
Engineer, No. 4102, August, 24, p. 189.
Railway accidents. (2 000 words.)

1934 **621 .131.3 (.42) & 621 .133 (.42)**
Engineer, No. 4102, August, 24, p. 191.
Tests on boiler of L. N. E. R. engine « No. 10 000 ». (3 300 words, 2 tables and fig.)

1934 **621 .87 (.42)**
Engineer, No. 4102, August, 24, p. 194.
50-ton crane for Southampton. (1 000 words and fig.)

1934 **691**
Engineer, No. 4102, August, 24, p. 195.
A rust-excluding solution. (300 words.)

1934 **621 .82**
Engineer, No. 4103, August, 31, p. 216.
ROBERTSON (D.). — **The whirling of shafts.** (4 300 words and fig.)

1934 **621 .43 (.44)**
Engineer, No. 4103, August, 31, p. 220.
A streamlined railcar. (300 words and fig.)

1934 **621 .115**
Engineer, No. 4104, September, 7, p. 226.
The **surface condenser.** (1 700 words and fig.)

1934 **669 (06 (.42**
Engineer, No. 4105, September, 14, p. 227.
The Institute of Metals. No. II. — The improvemer of **whit ebearing metals** for severe service : Son general considerations, by Mr. D. J. MacNaughtan; an three paperson the behaviour of white bearing meta when subjected to various deformation tests : Part by Mr. Kenneford and Dr. O'Neil (Indentation tests) Part II, by Mr. Arrowsmith (Tensile tests); Part II by Mr. Greenwood (Pounding tests.) (4 700 words.)

1934 **621 .8**
Engineer, No. 4104, September 7, p. 228.
ROBERTSON (D.). — **The whirling of shafts.** (3 20 words and fig.)

1934 **656 .212.**
Engineer, No. 4104, September 7, p. 241.
Self-contained **electric capstan unit.** (600 words an fig.)

1934 **621 .3**
Engineer, No. 4104, September 7, p. 243.
Engineer, No. 4105, September 14, p. 269.
Sources of cheap **electric power.** Address by Professo Francis G. BAILY. (8 700 words and fig.)

1934 **656 .211.7 (.51**
Engineer, No. 4105, September 14, p. 255.
The Nanking-Pukow **train ferry.** (1 500 words an fig.)

1934 **62. (01 & 669 .**
The Metallurgist, p. 150, Supplt. to the Engineer August 31.
Torsion impact tests. (900 words and fig.)

1934 **62. (01 & 669**
The Metallurgist, p. 152, Supplt. to the Engineer August 31.
The distribution of **elastic strain** in metal specimens (1 100 words and fig.)

1934 **669 .**
The Metallurgist, p. 156, Supplt. to the Engineer August 31.
Sulphur in iron, steel, ferro-alloys, slags and ores (1 600 words.)

1934 **669 .**
The Metallurgist, p. 158, Supplt. to the Engineer August 31.
Recent **calorimetric investigations on steel.** (2 00 words and fig.)

Engineering. (London.)

1934 **621 .43 (.73)**
Engineering, No. 3580, August 24, p. 190.
The Chicago, Burlington and Quincy « **Zephyr** » train (1 600 words and fig.)

1934 **656 .212.6 (.495)**
Engineering, No. 3580, August 24, p. 194.
Coal transporters at the port of Piræus, Greece (1 000 words and fig.)

1934 621 .94 (.42)
ngineering, No. 3580, August 24, p. 205.
Heavy-duty combination turret lathe. (1 000 words nd fig.)

1934 624 .2
ngineering, No. 3580, August 24, p. 207.
TIMOSHENKO (S.). — The stability of the webs f plate girders. (4 800 words and fig.)

1934 621 .87
ngineering, No. 3581, August 31, p. 218.
Electro-hydraulic mobile crane. (700 words and fig.)

1934 626 .131.4
ngineering, No. 3581, August 31, p. 221.
9-cubic yard electrically-operated shovel excavator. 4 000 words and fig.)

1934 65
ngineering, No. 3581, August 31, p. 230.
ELBOURNE (E. T.). — Workshop organisation and anagement. (5 000 words.)

1934 625 .1 (.45)
ngineering, No. 3582, September 7, p. 239.
The Bologna-Florence « Direttissima ». (4 400 words nd fig.)

1934 53 (06 & 656 .221
ngineering, No. 3582, September 7, p. 242.
The National Physical Laboratory. — Wind-tunnel quipment. (3 700 words and fig.)

1934 621 .335 (.52) & 621 .43 (.52)
ngineering, No. 3582, September 7, p. 244.
600-h.p. Diesel locomotive for Japanese State Rys. 900 words and fig.)

1934 669 (06 (.42)
ngineering, No. 3582, September 7, p. 255.
The Institute of Metals; Manchester Meeting. (1 800 ords.)

1934 385. (072 (.42)
ngineering, No. 3582, September 7, p. 263.
Research department of the United Steel Companies imited. (2 000 words and fig.)

1934 669 (06 (.42)
ngineering, No. 3583, September 14, p. 285.
The Institute of Metals; Manchester Meeting. eformation tests on white bearing metals. (4 300 ords.) (To be continued.)

1934 621 .33 (.42)
ngineering, No. 3583, September 14, p. 287.
Modernisation of the Tyneside electrified lines. (600 ords.)

1934 621 .31
ngineering, No. 3583, September 14, p. 290.
BAILY (F. G.). — Sources of cheap electric power. 5 800 words & fig.)

Engineering News-Record. (New York.)

1934 625 .13 (.73)
Engineering News-Record, No. 9, August 30, p. 277.
Liner plates carry fills in undertrack tunneling. (2 200 words & fig.)

1934 621 .39 (.71) & 626 (.71)
Engineering News-Record, No. 10, September 6, p. 291.
LOCKETT (R. G.). — Dependable canal operation by rugged electrical control. (1 600 words & fig.)

1934 691 (.492)
Engineering News-Record, No. 10, September 6, p. 299.
DIBBITS (H. A. M. C.). — Notes on vibrated concrete for a Dutch bridge. (1 700 words & fig.)

Great Western Railway Magazine. (London.)

1934 656 .227 (.42)
Great Western Ry. Magazine, October, p. 439.
An exceptional « exceptional load ». (1 700 words & fig.)

1934 621 .392 (.42) & 625 .17 (.42)
Great Western Ry. Magazine, October, p. 451.
PANNELL (J. P. M.). — Permanent way welding progress. (1 300 words & fig.)

1934 625 .143 (.42)
Great Western Ry. Magazine, October, p. 461.
BOWLER (F. T.). — Great Western Railway permanent way practice. No. III. — The design and manufacture of track compoments. (1 600 words & fig.)

Journal, Institution of Engineers, Australia. (Sydney, N. S. W.)

1934 621 .18
Journal, Institut. of Engineers, Australia, July, p. 221.
ROBERTS (F. H.). — Factors affecting the selection and design of modern steam generating plant. (11 000 words & fig.)

Mechanical Engineering. (New York.)

1934 62. (01 & 621 .88
Mechanical Engineering, September, p. 543.
DAVIDSON (W. F.). — The strength of alloy-steel bolts. (900 words & fig.)

Modern Transport. (London.)

1934 656 .212.5
Modern Transport, No. 806, August 25, p. 3.
Marshalling yard design and operation. (2 500 words.)

1934 621 .132.3 (.43)
Modern Transport, No. 806, August 25, p. 4.
New 4-6-2 type superheated four-cylinder compounds. (1 200 words & fig.)

1934 **385 (.44) & 656 .2 (.44)**
Modern Transport, No. 806, August 25, p. 5.
Railway communications in France. — No. 3. — **Electrification schemes.** (2 600 words.)

1934 **621 .43 (.73)**
Modern Transport, No. 806, August 25, p. 7.
Light-weight high-speed trains in U. S. A. (1 300 words & fig.)

1934 **656 .212.9**
Modern Transport, No. 807, September 1, p. 3.
Railway goods depot administration. — Factors providing economy. (1 700 words & fig.)

1934 **625 .245 (.44)**
Modern Transport, No. 807, September 1, p. 5.
New system of **road-rail transport.** (600 words & fig.)

1934 **621 .132.5 (.68)**
Modern Transport, No. 807, September 1, p. 7.
A **2-10-2 type engine** to be built at Pretoria. (900 words & fig.)

1934 **385 .1 (.931)**
Modern Transport, No. 808, September 8, p. 6.
VALENTINE (H.). — **Rail transport** in New Zealand. Circumstances demanding monopoly control. (3 500 words.)

1934 **625 .244 (.44)**
Modern Transport, No. 808, September 8, p. 9.
Refrigerated transport in France. — New methods in conveyance of fruit. (1 400 words & fig.)

1934 **38 & 656**
Modern Transport, No. 809, September 15, p. 3.
HALLSWORTH (H. M.). — Future of railways. — **Absorption of road and air services advocated.** (5 000 words.)

1934 **621 .33 (.493)**
Modern Transport, No. 809, September 15, p. 8.
Railway electrification in Belgium. — The Brussels-Antwerp line. (1 600 words & fig.)

1934 **621 .43 (.436 + .439)**
Modern Transport, No. 809, September 15, p. 9.
Another international **railcar** service Vienna-Budapest. (400 words.)

1934 **621 .43 (.42) & 656 .261 (.42)**
Modern Transport, No. 809, September 15, p. 13.
Great Western Railway **road fleet.** — Maintenance methods. (1 200 words.)

1934 **621 .43 (.436 + .439)**
Modern Transport, No. 810, September 22, p. 3.
STRAUSS (F.). — **An international railcar service.** The Vienna-Budapest proposal. (1 000 words & fig.)

1934 **656 .213 (.42)**
Modern Transport, No. 810, September 22, p. 5.
Improved steamship facilities for L. N. E. R. — Important extension to Parkeston Quay, Harwich (1 600 words & fig.)

1934 **625 .244 (.45)**
Modern Transport, No. 810, September 22, p. 7.
A mobile refrigerating system for **container traffi** in Italy. (800 words & fig.)

1934 **385 .1 (.68)**
Modern Transport, No. 811, September 29, p. 3.
South African Railways. — Recommendations of the Granet Commission. (2 200 words.)

1934 **656 .211**
Modern Transport, No. 811, September 29, p. 5.
Passenger station design and lay-out. Securing punctuality and efficiency. (1 300 words & fig.)

1934 **656 .213 (.42)**
Modern Transport, No. 811, September 29, p. 5.
Completion of new fish dock at Grimsby. (4 500 words & fig.)

1934 **656 .253 (.42)**
Modern Transport, No. 811, September 29, p. 11.
Advantages of modern **signalling.** Gidea Park-Shenfield installation. (2 000 words & fig.)

Proceedings, American Society of Civil Engineers. (New York.)

1934 **621 .88**
Proceed., Amer. Soc. of Civil Engineers, August, p. 833
DUBIN (E. A.). — **Eccentric riveted connections** (1 400 words & fig.)

1934 **721 .2**
Proceed., Amer. Soc. of Civil Engineers, August, p. 841
SUTTON PIPPARD (A. J.). — Determination of trapezoidal profiles for **retaining walls.** (2300 words & fig.)

1934 **624 .5**
Proceed., Amer. Soc. of Civil Engineers, August, p. 890
A generalized deflection theory for **suspension bridges.** (5 000 words & fig.)

1934 **624 .63**
Proceed., Amer. Soc. of Civil Engineers, August, p. 912
McGULLOUGH (C. B.). — Laboratory tests of multiple-span reinforced **concrete arch bridges.** (2 500 words & fig.)

Proceedings, Institution of Mechanical Engineers. (London.)

1934 **621 .116**
Proceed., Institut. of Mech. Engineers, Vol. 126, p. 59
HODGSON (J. L.) and ROBINSON (L. L.). — The development of **automatic combustion control systems** for industrial and power station boilers. (45 000 words & fig.)

1934 **621 .115**
roceed., Institut. of Mech. Engineers, Vol. 126, p. 227.
GUY (H. L.) and WINSTANLEY (E. V.). — Some
ctors in the design of **surface condensing plant.** (39 000
ords, tables & fig.)

1934 **621 .3**
roceed., Institut. of Mech. Engineers, Vol. 126, p. 329.
TRENCHMAN (H.). — **The mechanics of electrical.**
27 000 words, tables & fig.)

1934 **62. (01**
roceed., Institut. of Mech. Engineers, Vol. 126, p. 407.
COOK (G.). — The **stresses** in thick-walled cylinders
mild steel overstrained by internal pressure. (19 000
ords, tables & fig.)

1934 **621 .135.4**
roceed., Institut. of Mech. Engineers, Vol. 126, p. 457.
PORTER (S. R. M.). — **The mechanics of a locomo-**
ve on curved track. (1 500 words & fig.)

Railway Age. (New York.)

1934 **624 .8 (.73)**
ailway Age, No. 6, August 11, p. 168.
Convert old fixed spans into vertical lift spans.
3 000 words & fig.)

1934 **656 .223.2 (.73)**
ailway Age, No. 6, August 11, p. 172.
Empty mileage and car pooling. (4 500 words.)

1934 **625 .243 (.73)**
ailway Age, No. 6, August 11, p. 177.
Impact tests of box cars by A. R. A. (4 200 words
fig.)

1934 **621 .43 (.73)**
ailway Age, No. 7, August 18, p. 199.
Westinghouse 800-h.p. Diesel-electric heavy switch-
ng locomotive. (700 words & fig.)

1934 **625 .252 (.73)**
ailway Age, No. 7, August 18, p. 204.
New adaptations of Simplex clasp brakes. (900 words
fig.)

1934 **621 .335 (.73) & 621 .43 (.73)**
ailway Age, No. 7, August, p. 208.
BREHOB (F. H.). — **Oil-electric 600-h.p. switchers**
or the Lackawanna. (1 500 words & fig.)

1934 **625 .162 (.73)**
ailway Age, No. 7, August, p. 215.
How the Erie has reduced **highway crossing accidents.**
2 400 words & fig.)

1934 **656 .258 (.73)**
ailway Age, No. 8, August 25, p. 226.
Chesapeake & Ohio combines two **interlockings in**
ntralized control. (1 500 words & fig.)

1934 **621 .133.7 (.73)**
ailway Age, No. 8, August 25, p. 229.
Automatic softening plant handles polluted water.
2 300 words & fig.)

1934 **625 .245 (.73) & 625 .246 (.73)**
Railway Age, No. 8, August 25, p. 233.
Baltimore & Ohio builds **all-aluminium hopper car.**
(700 words & fig.)

1934 **656 .225 (.73)**
Railway Age, No. 8, August 25, p. 235.
Merchants Despatch Transportation Company deve-
lops **trailer tank for milk service.** (1 100 words & fig.)

1934 **625 .261 (.73)**
Railway Age, No. 8, August 25, p. 238.
Storedoor service for automobiles. (1 500 words &
fig.)

1934 **625 .143.5 (.73) & 625 .173 (.73)**
Railway Age, No. 9, September 1, p. 257.
Special car grinds corrugations from track rails.
(1 200 words & fig.)

1934 **625 .234 (.73)**
Railawy Age, No. 9, September 1, p. 259.
New Haven equips 69 cars with **air conditioning.**
(1 300 words & fig.)

1934 **624 .8 (.73)**
Railway Age, No. 10, September 8, p. 279.
New bascule span replaces two old swing spans.
(3 400 words & fig.)

1934 **621 .131.3 (.42) & 621 .132.3 (.42)**
Railway Age, No. 10, September 8, p. 289.
POULTNEY (E. C.). — Test run made with **L. &**
N. E. 2-8-2 locomotive. (2 000 words & fig.)

1934 **625 .111 (.73)**
Railway Age, No. 11, September 15, p. 305.
Extensive **grade separation** project has many points
of interest. (4 200 words & fig.)

1934 **385 .113 (.42)**
Railway Age, No. 11, September 15, p. 310.
LOCK (C. S.). — **Railways of Great Britain** reaping
rewards of enterprise. (4 500 words & fig.)

1934 **656 .222.6 (.42)**
Railway Age, No. 11, September 15, p. 316.
Fast freights at consistent speeds. (2 200 words &
fig.)

1934 **621 .335 (.73) & 621 .43 (.73)**
Railway Age, No. 11, September 15, p. 319.
Alco 600-h.p. Diesel-electric switching locomotives.
(1 500 words & fig.)

1934 **656 .1 (.73)**
Railway Age, No. 12, September 22, p. 349.
Burlington expands **bus operations.** (900 words &
fig.)

1934 **656 .261 (.73)**
Railway Age, No. 12, September 22, p. 351.
Makes scientific study of **storedoor operations.**
Part I. (2 600 words & fig.)

Railway Engineer. (London.)

1934 **621 .392 & 625 .212**
Railway Engineer, September, p. 265.
The **electric welding** of tyres. (1 300 words.)

1934 **625 .232 (.42)**
Railway Engineer, September, p. 266.
New **express freight depot** at Rouen. (500 words & fig.)

1934 **621 .132.1 (.73)**
Railway Engineer, September, p. 271.
POULTNEY (E. C.). — **Recent American locomotive practice.** (4 200 words, tables & fig.)

1934 **62. (01, 621 .392 & 624**
Railway Engineer, September, p. 277.
BONDY (O.). — **Electrically-welded railway bridges.** (2 800 words & fig.)

1934 **621 .135.4**
Railway Engineer, September, p. 282.
PORTER (late S. R. M.). — **The mechanics of a locomotive on curved track.** — III. (5 200 words & fig.)

1934 **621 .132.3 (.42)**
Railway Engineer, September, p. 287.
New 4-6-0 locomotives, L. M. S. Ry. (900 words & fig.)

1934 **526 & 625 .17**
Railway Engineer, September, p. 289.
Surveying for railway maintenance. — I. (4 700 words & fig.)

Railway Engineering and Maintenance. (Chicago.)

1934 **625 .143.5 (.73) & 625 .172 (.73)**
Railway Engineering & Maintenance, September, p. 472.
Grinding corrugations out of rail. (3 000 words & fig.)

1934 **621 .133.7 (.73)**
Railway Engineering & Maintenance. September, p. 476.
BARDWELL (R. C.). — Better **boiler water.** — What has been done about it. (3 200 words & fig.)

1934 **625 .154 (.71)**
Railway Engineering & Maintenance, September, p. 480.
Adding life to old **turntables.** (2 200 words & fig.)

Railway Gazette. (London.)

1934 **621 .133.3 & 669 .1**
Railway Gazette, No. 7, August 17, p. 265.
Metallurgy of the **high-pressure boiler.** (1 000 words.)

1934 **621 .135.2 & 625 .214**
Railway Gazette, No. 7, August 17, p. 271.
Cleaning and reclaiming axle-box oil and packing. (1 500 words & fig.)

1934 **656 .212.6 (.44)**
Railway Gazette, No. 7, August 17, p. 273.
New **express freight depot** at Rouen. (500 words & fig.)

1934 **625 .232 (.494)**
Railway Gazette, No. 8, August 24, p. 301.
New **passenger coaches** for the Swiss Federal Rys (2 000 words & fig.)

1934 **625 .232 (.945) & 656 .224 (.945)**
Railway Gazette, No. 8, August 24, p. 305.
Railway cruising in Australia. (1 000 words & fig.)

1934 **621 .132.3 (.42)**
Railway Gazette, No. 8, August 24, p. 308.
Three-cylinder 4-6-0 type express locomotives, L. M. S. Ry. (200 words & fig.)

1934 **621 .135.2**
Railway Gazette, No. 9, August 31, p. 343.
Anti-friction bearings for locomotives. (1 600 words & fig.)

1934 **656 .225**
Railway Gazette, No. 9, August 31, p. 346.
Cash-on-delivery systems. (850 words.)

1934 **656 .225 (.42) & 656 .261 (.42)**
Railway Gazette, No. 9, August 31, p. 347.
Containers. (500 words & fig.)

1934 **656 .1 (.489)**
Railway Gazette, No. 9, August 31, p. 348.
Suburban road traffic at Copenhagen. (400 words & fig.)

1934 **656 .222.1 (.4)**
Railway Gazette, No. 9, August 31, p. 354.
European **express train services in 1934.** (2 400 words & tables.)

1934 **621 .134.1 (.54)**
Railway Gazette, No. 10, September 7, p. 378.
The locomotive **booster** in India. (500 words & fig.)

1934 **625 .234**
Railway Gazette, No. 10, September 7, p. 379.
MIALL (S.). — **Air conditioning of trains.** — II. (1 900 words & fig.)

1934 **625 .245 (.47)**
Railway Gazette, No. 10, September 7, p. 381.
High capacity bogie well wagon for Russia. (300 words & fig.)

1934 **656 .254 (.43)**
Railway Gazette, No. 10, September 7, p. 382.
Automatic train control on the German State Railway. (1 300 words & fig.)

1934 **621 .132.6 (.44)**
Railway Gazette, No. 10, September 7, p. 385.
2-8-2 tank locomotives, Eastern Ry. of France. (800 words & fig.)

1934 **625 .232 (.42)**
ailway Gazette, No. 10, September 7, p. 387.
New Post Office vehicles, L. M. S. Ry. (500 words fig.)

1934 **656 .211.5 (.42)**
ailway Gazette, No. 10, September 7, p. 390.
The mechanical informator. — An **electrically oper-ed indicator giving time-tables** to and from indivi-ual stations. (400 words & fig.)

1934 **625 .1 (.931)**
ailway Gazette, No. 11, September 14, p. 428.
North Island main trunk line, New Zealand, describ-g engineering features, including the Raurimu spiral, pographical characteristics. (1 200 words & fig.)

1934 **621 .132.5 (.43)**
ailway Gazette, No. 11, September 14, p. 431.
New German-built **ten coupled goods locomotives.** 00 words & fig.)

1934 **621 .31**
lectric Ry. Traction, p. 320, Suppl. to the Ry. Gazette, August 24.
High-voltage metal-clad switchgear. (700 words & g.)

1934 **621 .33 (.44)**
lectric Ry. Traction, p. 321, Suppl. to the Ry. Gazette, August 24.
Notes on **electrification** in France. (900 words & fig.)

1934 **621 .33 (.728.6)**
lectric Ry. Traction, p. 324, Suppl. to the Ry. Gazette, August 24.
Electrification of the Costa Rica State Railway. 2 100 words & fig.)

1934 **621 .31**
lectric Ry. Traction, p. 327, Suppl. to the Ry. Gazette, August 24.
Mercury arc rectifiers. — IV. The operation of **steel nk rectifiers** and special applications of grid control traction service. (4 500 words & fig.)

1934 **621 .335 (.492) & 621 .43 (.492)**
iesel Ry Traction, p. 400, Suppl. to the Ry. Gazette, September 7.
LABRIJN (P.). — New **loco-tractors** in Holland. 400 words & fig.)

1934 **621 .43 (.494)**
iesel Ry. Traction, p. 404, Suppl. to the Ry. Gazette, September 7.
Light Diesel cars for Switzerland. (600 words & fig.)

1934 **621 .43 (.67)**
iesel Ry. Traction, p. 405, Suppl. to the Ry. Gazette, September 7.
New African **cars.** (350 words & fig.)

1934 **621 .43**
iesel Ry. Traction, p. 408, Suppl. to the Ry. Gazette, September 7.
Separate-compression system for Diesel locomotives nd railcars. (1 200 words & fig.)

1934 **621 .43 (.73)**
Diesel Ry. Traction, p. 410, Suppl. to the Ry. Gazette, September 7.
Diesel railcar rebuilt from petrol vehicle on U. S. A. railroad. (1 000 words & fig.)

1934 **621 .43 (.437)**
Diesel Ry. Traction, p. 412, Suppl. to the Ry. Gazette, September 7.
Railcars with horizontal engines. (700 words & fig.)

1934 **621 .43 (.47)**
Diesel Ry. Traction, p. 415, Suppl. to the Ry. Gazette, September 7.
New high-powered Russian Diesel locomotive. (850 words & fig.)

1934 **621 .43 (.439)**
Diesel Ry. Traction, p. 416, Suppl. to the Ry. Gazette, September 7.
Operating results of Hungarian Diesel railcar. (200 words & fig.)

Railway Magazine. (London.)

1934 **656 .222.1 (.4)**
Railway Magazine, September, p. 161.
Continental **summer train services,** 1934. (3 300 words & tables.)

1934 **656 .222.1 (.42)**
Railway Magazine, September, p. 193.
The **fastest trains** in Great Britain. (1 100 words, 1 table & fig.)

1934 **656 .222.1 (.44)**
Railway Magazine, October, p. 238.
Modern locomotive work in France. — IV. — Chemin de fer du Nord. (3 000 words, tables & fig.)

1934 **656 .222.1 (.42)**
Railway Magazine, October, p. 245.
ALLEN (C. J.). — **British locomotive practice and performance.** (4 000 words, tables & fig.)

Railway Mechanical Engineer. (New York.)

1934 **621 .43 (.73)**
Railway Mechanical Engineer, September, p. 307.
Westinghouse builds **800-h.p., 110-ton Diesel-electric switcher.** (4 100 words & fig.)

1934 **656 .221**
Railway Mechanical Engineer, September, p. 312.
KLEMIN (A.). — **Aerodynamics of the railway train.** (2 500 words & fig.)

1934 **625 .216 & 625 .251**
Railway Mechanical Engineer, September, p. 319.
WIKANDER (O. R.). — **Brake and draft-gear action** during emergency applications. (2 600 words.)

1934 **625 .243 (.73)**
Railway Mechanical Engineer, September, p. 322.
Tests of box-car designs made by A. R. A. (5 800 words & fig.)

1934 **621 .134.2 (.73)**
Railway Mechanical Engineer, September, p. 327.
Baldwin power reverse gears. (600 words & fig.)

Railway Signaling. (Chicago.)

1934 **656 .256.3 (.73)**
Railway Signaling, September, p. 439.
Color-light automatics operated on primary battery. — Three-position searchlight signals controlled by polarized track with approach lighting. (2 000 words, 1 table & fig.)

1934 **656 .255 (.73)**
Railway Signaling, September, p. 443.
Centralized traffic control installed on the Alton. (2 400 words & fig.)

1934 **656 .253 (.73)**
Railway Signaling, September, p. 445.
RYAN (F. J.). — **Battery saving for semaphores** on the Illinois Central. (900 words & fig.)

1934 **656 .259 (.73)**
Railway Signaling, September, p. 447.
ELSWORTH (R. B.). — The application of **derails.** (2 200 words & fig.)

1934 **656 .25 (0**
Railway Signaling, September, p. 449.
Test of a **distribution line for A.-C. floating system.** (3 000 words, 5 tables & fig.)

1934 **625 .162 (.73) & 656 .254 (.73)**
Railway Signaling, September, p. 453.
Gates replaced by traffic lights and signals in Detroit. (700 words & fig.)

The Locomotive. (London.)

1934 **621 .132.3 (.42)**
The Locomotive, September 15, p. 266.
Two-cylinder 4-6-0 mixed traffic locomotives, L. M. & S. Ry. (1 100 words & fig.)

1934 **625 .245 (.47)**
The Locomotive, September 15, p. 271.
200-ton bogie well-wagon for the Russian Railways. (350 words & fig.)

1934 **625 .232 (.41)**
The Locomotive, September 15, p. 276.
Rebuilt dining car, Great Northern Ry. (Ireland). (650 words & fig.)

1934 **621 .133.(**
The Locomotive, September 15, p. 278.
BREWER (F. W.). — **Locomotive regulators.** — Some early and modern types. (1 400 words & fig.)

1934 **621 .392 & 621 .138..**
The Locomotive, September 15, p. 283.
Notes on welding in locomotive workshops. (1 400 words.)

1934 **621 .134.5**
The Locomotive, September 15, p. 292.
Lubricating the steam locomotive. (1 500 words.)

Transit Journal. (New York.)

1934 **621 .338 (.73)**
Transit Journal, August, p. 251.
Brooklyn-Manhattan Transit Corporation **stainless steel car** delivered. (2 800 words & fig.)

1934 **621 .33 (.73**
Transit Journal, August, p. 255.
Pennsylvania **electrification** to be finished soon (2 000 words & fig.)

1934 **621 .338 (.73**
Transit Journal, September, p. 274.
P. C. C. car completed. (1 300 words & fig.)

1934 **621 .33(**
Transit Journal, September, p. 287.
BIRCH (L. W.). — **Grooved wire fittings show progress in overhead.** (1 800 words & fig.)

In Spanish.

Caminos de hierro. (Madrid.)

1934 **38**
Caminos de hierro, Agosto, p. 203.
MONREAL (M.) & CASTILLO (M.). — La **crisi ferroviaria** y sus posibles remedios. (800 palabras (Continuará.)

Gaceta de los Caminos de hierro. (Madrid.)

1934 **624 .63 (.460**
Gaceta de los Caminos de hierro, nº 18, 15 de Septiembre, p. 333.
CASADO (C. F.). — El nuevo **puente** de Puerta d Hierro sobre el río Manzanares, en Madrid. (2 00 palabras & fig.)

Ingenieria y Construcción. (Madrid.)

1934 **624 .63 (.460**
Ingenieria y Construcción, Septiembre, p. 537.
BURGUERA (J.). — **Puente de Aragón** sobre el r Turia, en Valencia. (2 800 palabras & fig.)

1934 **691**
Ingenieria y Construcción, Septiembre, p. 562.
Vibración y pervibración del hormigón. (4 000 palabras & fig.)

Los Transportes. (Madrid.)

1934 **656 .254 & 656 .1**
Los Transportes, nº 383, 1 de Septiembre, p. 257.
Los **pasos a nivel** y el transporte por carretera. (2 000 palabras.)

1934 **656 .23 (0**
Los Transportes, nº 383, 1 de Septiembre, p. 259.
MERINO (J.). — Ni un kilómetro más. (2 400 palabras.)

Revista de Obras Públicas. (Madrid.)

1934 **385 (.460) & 656 (.460)**
Revista de Obras Públicas, nº 17, 1 de Septiembre, p. 327.
VELAO (A.). — El **problema ferroviario.** (2 900 palabras.)

In Italian.

La tecnica professionale. (Firenze.)

1934 **385 .524 (.45)**
La tecnica professionale, settembre, p. 231.
STROCCHI (F.). — Il **lavoro a premio** nelle squadre di rialzo nell'esercizio 1932-33. (1 800 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1934 **625 .111 (.45) & 625 .13 (.15)**
Rivista tecnica delle ferrovie italiane, 15 agosto, p. 79.
GAMBERINI (L.). — **Operazioni topografiche** eseguite per la verifica del tracciato della galleria dell'Appennino della direttissima Bologna-Firenze. (4 500 parole & fig.)

1934 **656 .224**
Rivista tecnica delle ferrovie italiane, 15 agosto, p. 96.
LANDRA (A.). — Per l'**unificazione delle condizioni di trasporto.** Avvicinamento delle norme dei trasporti ferroviari in servizio interno a quelle del servizio internazionale. (10 800 parole.)

1934 **656 .254**
Rivista tecnica delle ferrovie italiane, 15 agosto, p. 116.
PACETTI (G.). — **Istrumento di consenso** a manigli tipo F. S. (3 000 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **385 .587**
De Ingenieur, Nr 37, 14 September, p. T. 83.
HIJMANS (E.). — **50 jaar na Taylor.** (6 800 woorden & fig.)

1934 **62. (01**
De Ingenieur, Nr 37, 14 September, p. A. 345.
van ITERSON (F. K. Th.). — **Knikweerstand** van gedrongen gedrukte staven. (2 800 woorden.)

1934 **624 .62 (.492)**
De Ingenieur, Nr 37, 14 September, p. B. 159.
HARMSEN (W. J. H.). — De **brug** voor gewoon verkeer over de Lek te Vianen. (5 800 woorden & fig.)

1934 **624 .8 (.492)**
De Ingenieur, Nr 37, 14 September, p. B. 169.
MUNDT (Th. W.). — Montage van de **spoorbrug** over den Ijsel bij Hattemerbroek. (1 200 woorden.)

Spoor- en Tramwegen. (Utrecht.)

1934 **385. (07.5 (.436)**
Spoor- en Tramwegen, Nr 19, 11 September, p. 505.
Het Weensche **spoorwegmuseum.** (700 woorden & fig.)

In Polish.

(= 91.885)

Inżynier Kolejowy. (Warszawa.)

1934 **625 .113 = 91 .885 & 625 .144.2 = 91 .885**
Inzynier Kolejowy, No. 1, p. 1.
JACYNA (W.). — Gauge widening on curves. (7 200 words & fig.)

1934 **656 .254 = 91 .885**
Inzynier Kolejowy, No. 3, p. 65.
KAWALCZEWSKI (W.). — Level crossing protection by means of automatic signals. (3 000 words & fig.)

1934 **625 .13 (.438) = 91 .885**
Inzynier Kolejowy, No. 4, p. 80.
SZELAGOWSKI (F.). — Strengthening short-span bays of the road-and-railway bridge over the Vistule at Torun. (2 400 words & fig.)

1934 **621 .131.2 = 91 .885**
Inzynier Kolejowy, No. 4, p. 87.
MADEYSKI (J.). — How to improve the output of boilers on superheated locomotives and their power without increasing their weight. (3 300 words & fig.)

In Portuguese.

Gazeta dos Caminhos de ferro. (Lisboa.)

1934 **385 .113 (.67)**
Gazeta dos caminhos de ferro, nº 1121, 1 de setembro, p. 441.
de SOUSA (J. F.). — O **caminho de ferro** de Benguela. (1 900 palavras.)

In Rumanian.

(= 599)

Revista tecnica C. F. R. (Bucuresti.)

1934 **621 .138.5 (.498) = 599**

Revista tecnica C. F. R., January, p. 1.

CASUTA (St.). — **Modernisation et rationalisation** of the Bucharest and Grivita locomotive workshops. (7 400 words & fig.)

1934 **621 .132.2 = 599 & 656 .882 = 599**

Revista tecnica C. F. R., March, p. 90.

VASILIU (A. L.). — Locomotive copper fireboxes repaired by welding. (2 500 words & fig.)

1934 **625 .113 = 599**

Revista tecnica C. F. R., April, p. 105.

SERBESCU (D.). — **Influence des déclivités sur** behaviour of railway track. (5 200 words & fig.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

DECEMBER (1934)

016. 385. (02]

I. — BOOKS.

In French.

1934 621 .13 & 625 .2

Annuaire 1934-35 de la Chambre syndicale des fabricants et des constructeurs de matériel pour chemins de fer et tramways.

Paris (VIII[e]), édité par ladite Chambre syndicale, rue de Madrid. 1 volume (14 × 22), 520 pages.

1934 656

. ROCHEFOUCAULD (Comte Eugène de).

La coordination des transports ferroviaires et routiers.

Paris, Librairie du Recueil Sirey, 22, rue Soufflot. olume, 275 pages. (Prix : 40 fr. français.)

1934 656 .235

.ULY (J.).

Étude sur les rails de chemins de fer. Transport des rchandises.

Bruxelles, Comité Central Industriel de Belgique. olume, 121 pages.

1934 62. (01

GEAUD (G.).

Résistance des matériaux et élasticité.

Paris (VI[e]), Gauthier-Villars, 55, quai des Grands-gustins. 2 volumes. Tome I, 496 pages et figures. me II, 508 pages, 2 grandes planches et figures. rix : 90 fr. français chacun.)

1934 385 .113 (.437)

Rapport annuel de l'entreprise des Chemins de fer l'Etat tchécoslovaque pour l'exercice 1933.

Praha, Tiskl Josef Pacl v. Strakonicich. 1 volume,) pages et 1 carte.

1934 385. (08 (.493)

Rapports de l'Assemblée générale ordinaire du 15 oc- re 1934 de la Compagnie belge de chemins de fer d'entreprises. Exercice 1933-1934.

Bruxelles, Siège social de ladite Compagnie, 33, rue l'Industrie. 1 fascicule, 35 pages.

In German.

1934 669

FLEISCHMANN (E.).

Lagerweissmetalle und ihre Prüfung.

München und Leipzig, Fritz und Joseph Voglrieder. 1 Band, 89 Seiten (Preis : 4.50 R.M.)

1934 62. (01 & 669

HEROLD (W.).

Die Wechselfestigkeit metallischer Werkstoffe.

Wien, Julius Springer. 1 Band, 276 Seiten, 68 Zahlentafeln und 165 Abbildungen. (Preis : 24 R.M.)

1934 62. (01

LEHR (E.).

Spannungsverteilung in Konstruktionselementen.

Berlin, V. D. I. Verlag. 1 Band, 64 Seiten, 9 Tafeln und 179 Abbildungen. (Preis : 7.50 R.M.)

1934 621 .116

NETZ (H.).

Dampfkessel.

Leipzig und Berlin, Teubner, B. G. 1 Band, 68 Abbildungen. (Preis : 4.80 R.M.)

1934 536

NUSSELT (W.).

Technische Thermodynamik.

Berlin und Leipzig, Walter de Gruyter & Co. 1 Band, 144 Seiten, 65 Abbildungen. (Preis : 1.62 R.M.)

1934 656

PIRATH (C.).

Verkehrseinheit und Verkehrspolitik.

Berlin, Verkehrswissenschaftlichen Lehrmittelgesellschaft m. b. H. bei der Deutschen Reichsbahn. 1 Band, 34 Seiten. (Preis : 1.65 R.M.)

1934 625 .255

TÖFFLINGER (K.).

Neue elektrische Bremsverfahren für Strassen und Schnellbahnen.

Berlin, Julius Springer. 1 Band, 81 Seiten und 54 Bilder. (Preis : 7.20 R.M.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress jointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. Weissenbruch, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 1509).

In English.

1934 621 .43
DURNEY (W. C.).
Design of connecting-rods for high-speed internal combustion engines.
London, S. W. 1. Draughtsman Publishing Company, Ltd., 96, St George's-square. (Price : 2 sh. net.)

1934 536 (02
Abridged Callendar steam tables, Fahrenheit units. Third edition, revised by G. S. Callendar.
London, W. 1. Edward Arnold and Co., 41, Maddox-street. (Price : 1 sh.)

1934 385. (04 (.66)
GOLD COAST RAILWAY AND HARBOUR.
Administration reports for the year 1933-34.
Gold Coast. Printed by the Government Printer, at the Government Printing Office, Accra. 102 pages.

1934 388 (.73)
TRANSIT JOURNAL.
50 years of Progress. (Anniversary Number, 1884-1934).
New York, McGraw-Hill Publ. Co. Inc., 330, West 42nd street. Vol. 78, No. 10, September 15. (Price : Dollar 1.00.)

1934 614 .8 (.73) & 656 .25 (.73)
AMERICAN RAILWAY ASSOCIATION.
American railroad in laboratory : Vol. II, Saving life and limb.
Washington, D. C. Published by the Association. (6 × 9 inches), 210 pages, photographs and tables.

1934 691 (06 (.42)
BRITISH WOOD PRESERVING ASSOCIATION.
Journal of the British Wood Preserving Association, 1934.
London, Piccadilly, 166. Published by the Association. (9 3/4 × 6 inches), 135 pages. (Price : 7 sh. 6 d.)

1934 385. (08 (.52)
GOVERNMENT OF JAPAN. DEPARTMENT OF RAILWAYS.
Annual report for the year ending, March 31st, 1933.
Tokyo. Printed by the Nippon Press.

1929 621 .131.2
DALBY (W. E.).
The balancing of engines.
London, Edward Arnold & Co. 4th edition. 1 book, 321 pages and figures.

1933 351 .757
SHALLOO (J. P.).
Private police with special reference to Pennsylvania.
Philadelphia, American Academy of Political and Social Science. 1 book, 224 pages.

1934 621 .132.8
« SENTINEL » WAGGON WORKS Ltd., RAILWAY DEPARTMENT.
« Sentinel » patent general service locomotives.
General description. Performance. Boilers, Woolnough type. Engines. Main frame and running gear. Controls.
A Catalogue (9 1/2 × 8 inches) with many half tone engravings and inset drawings. — Published by the « Sentinel » Waggon Works Ltd., Railway Department, Iddlesleigh House, Caxton Street, Westminster, London S. W. 1. (Apply.)

1934 621 .4
ROSBLOOM (J.).
Diesel handbook. A practical book of instruction for engineers and students on modern Diesel engineering land, marine, locomotive, aero, automotive and portable installations.
Jersey City, N. Y. (U. S. A.). Diesel Engineering Institute (5 × 7 inches), 352 pages, illust., diagrams charts, tables. (Price : Dollar 5.00.)

In Spanish.

1934 385. (08 (.460)
COMPANIA DE LOS FERROCARRILES DE MADRID A ZARAGOZA Y A ALICANTE.
Memoria que presenta el Consejo de Administración a la Junta General de Señores accionistas convocada para el 27 de mayo de 1934.
Madrid, Artes Gráficas, Paseo de San Vicente, 20. 1 volumen, 319 páginas.

1934 313 .385 (.82
Estadística de los ferrocarriles en explotación en la República argentina. Año 1930 (con los resultados principales de la explotación hasta 1933).
Buenos-Aires, Ministerio de Obras Públicas. 1 volumen, 381 páginas.

1934 313 .385 (.82
Estadística de los ferrocarriles en explotación en la República argentina. Año 1931 (con los resultados principales de la explotación hasta 1933).
Buenos-Aires, Ministerio de Obras Públicas. 1 volumen, 381 páginas y 1 mapa.

In Italian.

1934 691 & 721
BELLONI (F.).
La resistenza delle sezioni in cemento armato.
Milano, Libreria Editrice Politecnica. 1 volume (17 × 25), 164 pagine. (Prezzo : 50 Lire.)

[016. 385. (05]

II. — PERIODICALS.

In French.

Annales des Ponts et Chaussées (Paris).

1934 **691 & 693**

nnales des ponts et chaussées, juillet-août, p. 50.

PIGEAUD. — Réflexions sur une théorie générale u **retrait des liants hydrauliques.** (9 000 mots & fig.)

1934 **625 .4 (.44)**

nnales des ponts et chaussées, juillet-août, p. 107.

BARDOUT. — Note sur l'exécution de la station Pont de Sèvres » du prolongement de la ligne n° 9 u **Chemin de fer métropolitain** de Paris. (4 300 mots fig.)

Bulletin de la Société des ingénieurs civils de France. (Paris.)

1934 **621 .43 & 625 .251**

Bulletin de la Soc. des ing. civ. de France, mars-avril, p. 246.

BORDE. — **Freinage des automotrices** de chemins de er. (11 700 mots & fig.)

Bulletin de l'Union internationale des chemins de fer. (Paris.)

1934 **621 .13 (.44), 621 .335 (.44) & 621 .43 (.44)**

Bulletin de l'Union intern. des ch. de fer, septembre, p. 299.

Certains types récents de **locomotives** des réseaux français. (4 500 mots, 3 tableaux & fig.)

1934 **385. (09.1 (.56)**

Bulletin de l'Union intern. des ch. de fer, septembre, p. 311.

Les chemins de fer d'Asie de la République de Turquie et des territoires sous mandat (Syrie, Palestine, Transjordanie, Irak). (7 400 mots & 1 carte.) (A suivre.)

1934 **385 .113 (.494)**

Bulletin de l'Union intern. des ch. de fer, septembre, p. 320.

Les Chemins de fer fédéraux suisses pendant l'exercice 1933. (7 300 mots.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1934 **656 .223 .2 & 656 .236 .2**

Bull. des transp. intern. par ch. de fer, octobre, p. 478.

La nature du contrat d'immatriculation des **wagons de particuliers** en droit français. (2 400 mots.)

1934 **313 .385 (.43)**

Bull. des transp. intern. par ch. de fer, octobre, p. 507.

Les **Chemins de fer allemands** pendant l'exercice 1932. (1 200 mots.)

1934 **385 .63**

Bull. des transp. intern. par ch. de fer, octobre, p. 125.

Convention Internationale pour le transport des marchandises par chemin de fer (C.I.M.). (27 000 mots.)

Bulletin technique de la Suisse romande. (Vevey.)

1934 **621 .43**

Bull. techn. de la Suisse romande, n° 20, 29 septembre, p. 234.

Transmission mécanique pour automotrices Diesel, système S. L. M.-Winterthur. (2 200 mots & fig.)

Chronique des transports. (Paris.)

1934 **656 (.44)**

Chronique des transports, n° 18, 25 septembre, p. 2.

La **coordination** du rail et de la route. Le pacte de Niort. (2 700 mots.)

1934 **656 .222 .5 (.44)**

Chronique des transports, n° 19, 10 octobre, p. 3.

Le **service d'hiver** des grands réseaux. (5 700 mots.)

Génie civil. (Paris.)

1934 **621 .392 & 665 .882**

Génie civil, n° 2719, 22 septembre, p. 256.

PIGEAUD (G.). — Réflexions sur l'emploi de la **soudure dans les constructions métalliques.** (4 500 mots & fig.)

1934 **625 .5 (.494)**

Génie civil, n° 2719, 22 septembre, p. 262.

Le **funiculaire** de Schwyz à Stoos (Suisse). (2 300 mots & fig.)

1934 **385. (09.1 (.47)**

Génie civil, n° 2719, 22 septembre, p. 268.

KANDAOUROFF (P.). — Le **développement du réseau ferré** et de son trafic de voyageurs en Russie, dans ces dernières années. (1 400 mots.)

1934 **621 .43**

Génie civil, n° 2720, 29 septembre, p. 277; n° 2721, 6 octobre, p. 306.

DELANGHE (G.). — La **locomotive Diesel-pneumatique, système Zarlatti,** à mélange d'air comprimé et de vapeur d'eau. (9 500 mots & fig.)

1934 **625 .212 & 625 .62**

Génie civil, n° 2721, 6 octobre, p. 295.

Voiture de tramways articulée, à essieux convergents, système Liechty. (600 mots & fig.)

1934 **691**

Génie civil, n° 2721, 6 octobre, p. 309.

MARCOTTE (E.). — Valeur des hydrofuges pour l'imperméabilisation des bétons. (4 600 mots & fig.)

1934 **656 .1 (.44) & 656 .2 (.44)**

Génie civil, n° 2723, 20 octobre, p. 365.

MESTRE (A.). — La coordination des transports routiers et ferroviaires de voyageurs. (Les accords de Rouen, du 25 mai 1934.) (2 300 mots.)

1934 **721 .3**

Génie civil, n° 2723, 20 octobre, p. 366.

CAUFOURIER (P.). — Le calcul des fondations des ouvrages en pleine terre. (1 900 mots & fig.)

1934 **656 .27 (.44)**

Génie civil, n° 2723, 20 octobre, p. 370.

Les facilités d'exploitation des lignes déficitaires des grands réseaux par les chemins de fer d'intérêt local. (2 300 mots.)

L'Allègement dans les Transports. (Lucerne.)

1934 **625 .2 (0**

L'Allègement dans les transports, septembre-octobre, p. 109.

GILARDI (U.). — De l'allègement du matériel roulant par l'emploi de métaux spéciaux. (2 900 mots & fig.)

La Science et la Vie. (Paris.)

1934 **621 .43**

La Science et la Vie, octobre, p. 339.

LEBLANC (Ch.). — Les autorails « Fiat ». (2 000 mots & fig.)

La Traction électrique. (Paris.)

1934 **621 .33**

La Traction Electrique, septembre, p. 165.

KOTSCHUBEY (N. de). — Redresseurs à vapeur de mercure dans les installations de grande traction électrique. (7 000 mots & fig.) (A suivre.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1934 **621 .43**

L'Ind. des voies ferrées et des transp. autom., septembre, p. 239.

MARTIN (J.). — Les moteurs de traction à injection. (7 700 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1934 **621 .392 (.438) & 625 .2 (.438)**

L'Ossature métallique, octobre, p. 511.

BRANDT (A.). — La soudure dans la construction du matériel roulant des chemins de fer polonais. (700 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1934 **621 .392 (.44) & 625 .243 (.44)**

Revue générale des chemins de fer, octobre, p. 255.

HEINISCH. — La construction, dans les ateliers de la Compagnie du Chemin de fer du Nord, de wagons métalliques couverts soudés. (4 300 mots & fig.)

1934 **625 .236 (.44) & 625 .26 (.44)**

Revue générale des chemins de fer, octobre, p. 268.

LAVIE. — Nettoyage des coussins et tapis des voitures aux ateliers d'Oullins. (3 500 mots & fig.)

1934 **385 .113 (.44)**

Revue générale des chemins de fer, octobre, p. 276.

Résultats obtenus en 1933 sur les Grands Réseaux de chemins de fer français. (Tableaux.)

1934 **621 .392 (.44) & 665 .882 (.44)**

Revue générale des chemins de fer, octobre, p. 298.

La soudo-brasure dans les ateliers de la Compagnie P. L. M. (2 200 mots & fig.)

Revue politique et parlementaire. (Paris.)

1934 **385 (.44) & 656 (.44)**

Revue politique et parlementaire, 10 octobre, p. 47.

PESCHAUD (M.). — La restauration des chemins de fer et la coordination des transports. (19 200 mots.)

Revue universelle des Mines. (Liége.)

1934 **656 .1 & 656 .235**

Revue universelle des mines, n° 19, 1er octobre, p. 509.

LAMALLE (U.). — Influence de la concurrence de l'auto sur le système tarifaire des chemins de fer. (4 300 mots, 5 tableaux & fig.)

In German.

Die Lokomotive. (Wien.)

1934 **385**

Die Lokomotive, Heft 9, September, S. 165.

Die Zukunft der Eisenbahnen. (2 800 Wörter und Abb.)

1934 **656 .224 & 621 .43**

Die Lokomotive, Heft 9, September, S. 173.

BAZANT (F.). — Personenverkehr und Triebwagenfrage. (2 000 Wörter.)

Elektrische Bahnen. (Berlin.)

1934 **621 .333**

Elektrische Bahnen, Heft 9, September, S. 193.

HERMLE. — Der Schnellzugsmotor EKB 860 der A.E.G. (2 500 Wörter und Abb.)

1934 **621 .33**

Elektrische Bahnen, Heft 9, September, S. 209.

FORWALD (H.). — Elektrischer Zugbetrieb bei 1 kV Gleichstrom. (3 500 Wörter und Abb.)

Glasers Annalen. (Berlin.)

1934 **62 (01**

lasers Annalen, Nr. 1373, 1. September, S. 33.

KÜHNEL (R.). — **Grenzen der Werkstoffleistung. auerbrüche** und ihre Ursachen. (2 400 Wörter und bb.) (Fortsetzung folgt.)

1934 **62. (01**

lasers Annalen, Nr. 1374, 15 September, S. 41.

KÜHNEL (R.). — **Grenzen der Werkstoffleistung. auerbrüche** und ihre Ursachen. (4 700 Wörter und bb.)

1934 **656 .222 .1**

lasers Annalen, Nr. 1375, 1. Oktober, S. 49.

VELTE. — **Nomographische Lösung fahrmechanischer nd energietechnischer Aufgaben.** (4 500 Wörter und bb.)

---

rgan für die Fortschritte des Eisenbahnwesens. (Berlin.)

1934 **621 .135. (01, 625 .14 (01 & 625 .22**

rgan für die Fortschritte des Eisenbahnwesens, Heft 19, 1. Oktober, S. 349.

Untersuchungen über das **Kräftespiel zwischen Fahrzeug und Oberbau.** (13 000 Wörter und Abb.)

1934 **624 .32 (.43) & 621 .392 (.43)**

rgan für die Fortschritte des Eisenbahnwesens, Heft 20, 15. Oktober, S. 371.

ZILLINGER (I.). — **Geschweisste Brücken** der Deutschen Reichsbahn. (3 300 Wörter und Abb.)

1934 **625 .143 .4 & 621 .392**

rgan für die Fortschritte des Eisenbahnwesens, Heft 20, 15. Oktober, S. 377.

WATTMANN (D.). — **Schienenschweissung auf rücken.** (5 300 Wörter und Abb.)

1934 **621 .132 .6 (.43)**

rgan für die Fortschritte des Eisenbahnwesens, Heft 20, 15. Oktober, S. 385.

1 E 1 **Einheits-Tenderlokomotiven** Reihe 85 der Deutschen Reichsbahn. (400 Wörter und Abb.)

---

eitschrift des Vereines Deutscher Ingenieure. (Berlin.)

1934 **625 .174**

eitsch. des Ver. deutsch. Ing., Nr. 38, 22. September, S. 1103.

BÖHMIG (W.). — **Schneebekämpfungsmaschinen** für isenbahnstrecken. (3 600 Wörter und Abb.)

1934 **621 .335**

eitsch. des Ver. deutsch. Ing., Nr. 39, 29. September, S. 1133.

SACHS (K.). — **Fortschritte im Bau elektrischer okomotiven. Elektrische Ausrüstung.** (6 300 Wörter nd Abb.)

1934 **625 .14 (01**

Zeitsch. des Ver. deutsch. Ing., Nr. 39, 29. September, S. 1153.

MEIER (H.). — **Die Stabilität des lückenlosen Vollbahngleises.** (7 000 Wörter, 3 Zahlentafeln und Abb.)

1934 **621 .132 .8**

Zeitsch. des Ver. deutsch. Ing., Nr. 39, 29. September, S. 1171.

Kondensations-Lokomotive. (800 Wörter und Abb.)

1934 **62. (01 & 669**

Zeitsch. des Ver. deutsch. Ing., Nr. 41, 13. Oktober, S. 1195.

SOMMER (H.). — Beziehungen zwischen den **Tiefzieh- und den Festigkeitseigenschaften verschiedener metalle.** (6 600 Wörter und Abb.)

1934 **621 .43 (.43)**

Zeitsch. des Ver. deutsch. Ing., Nr. 41, 13. Oktober, S. 1202.

BREUER. — **Triebwagen mit eigener Kraftquelle** für die Deutsche Reichsbahn. (1 000 Wörter und 3 Zahlentafeln.)

Zeitschrift für das gesamte Eisenbahn-Sicherungswesen. (Berlin.)

1934 **656 .256 (.13)**

Zeitsch. für das gesamte Eisenb.-Sicherungsw., Nr. 13, 10. Oktober, S. 157.

HOFMANN (K.). — Die **Blockanlagen** der Bauform Möllering. (1 400 Wörter und Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1934 **656 .231**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 39, 27. September, S. 681.

SPIESS (W.). — Der **Tarifpreis im Gütertransportgeschäft** der Eisenbahnen. (8 000 Wörter.)

1934 **656 .1 (.43)**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 39, 27. September, S. 693.

Die Gesellschaft « **Reichsautobahnen** » Ende Juli 1934. (700 Wörter und Karte.)

1934 **313 .385**

Zeitung des Vereins mitteleurop. Eisenbahnverwalt., Nr. 40, 4. Oktober, S. 709.

CAPELLE (G.). — **Statistik des Eisenbahnwesens** nach einheitlichen Richtlinien. (1 600 Wörter.)

In English.

Engineer. (London.)

1934 **621 .115**

Engineer, No. 4106, September 21, p. 276.

The surface condenser, No. V. Downflow : **The Weir condenser.** (1 600 words and fig.)

1934 **669 .1 (06 (.42)**
Engineer, No. 4106, September 21, p. 280.
The Iron and Steel Institute in Belgium and Luxemburg. (4 600 words.)

1934 **621 .13 & 624 (0**
Engineer, No. 4106, September 21, p. 282.
LOMONOSSOFF (G. V.). — **Locomotives and bridges.** (2 900 words and fig.)

1934 **621 .134 .1 & 656 .284**
Engineer, No. 4106, September 21, p. 287.
Failures of locomotive axles. (1 700 words.)

1934 **621 .39**
Engineer, No. 4106, September 21, p. 295.
RONAY (B.). — **Evolution of the arcronograph.** (3 000 words and fig.)

1934 **621 .43**
Engineer, No. 4107, September 28, p. 309.
Gas for internal combustion locomotives. (800 words.)

1934 **621 .115**
Engineer, No. 4107, September 28, p. 316; No. 4108, October 5, p. 326.
The surface condenser. (4 200 words and fig.)

1934 **621 .39**
Engineer, No. 4108, October 5, p. 332.
The **insulation of high-voltage alternators.** (1 500 words and fig.)

1934 **621 .131 .3 (.42)**
Engineer, No. 4108, October 5, p. 337.
The **locomotive testing station** again. (1 300 words.)

1934 **656 .28 (.42)**
Engineer, No. 4108, October 5, p. 337.
Railway accidents. (800 words.)

1934 **656 .1 & 656 .28**
Engineer, No. 4108, October 5, p. 340.
WALTON (D. W.). — **The statistical study of road accidents.** (4 000 words.)

1934 **621 .13 (0 & 621 .131 .3**
Engineer, No. 4108, October 5, p. 341.
GRESLEY (H. N.). — **Steam locomotive progress.** (2 700 words.)

1934 **625 .1 (.73)**
Engineer, No. 4108, October 5, p. 344.
A new American railway route. (1 200 words and fig.)

1934 **621 .115**
Engineer, No. 4109, October 12, p. 352.
The **surface condenser.** No. VIII. (2 800 words.)

1934 **656 .1 & 656 .28**
Engineer, No. 4109, October 12, p. 354.
WALTON (D. W.). — **The statistical study of road accidents.** (4 500 words.) (To be continued.)

1934 **656 .222 (.42)**
Engineer, No. 4109, October 12, p. 363.
Locomotive service. (1 200 words.)

1934 **621 .31 (.42)**
Engineer, No. 4109, October 12, p. 366.
The Galloway **water power scheme.** (3 800 words and fig.) (To be continued.)

1934 **621 .**
Engineer, No. 4109, October 12, p. 370.
CAREY (W. F.). — **Crushing and grinding.** (2 500 words and fig.)

1934 **621 .4**
Engineer, No. 4110, October 19, p. 380.
The **Zarlatti Diesel-pneumatic locomotive.** (600 words and fig.)

1934 **621 .**
Engineer, No. 4110, October 19, p. 384.
INGHAM (H. S.). — **A gear tooth designing machine** (2 600 words and fig.)

1934 **62. (01 & 621 .8**
Engineer, No. 4110, October 19, p. 386.
Testing machine for film strength of lubricants (1 200 words and fig.)

1934 **621 .332 & 721 .**
Engineer, No. 4110, October 19, p. 394.
Steel telegraph and transmission line poles. (80 words and fig.)

1934 **313 .656 .**
Engineer, No. 4110, October 19, p. 398.
Transports statistics : Their uses and abuses. (1 70 words.)

Engineering. (London.)

1934 **669 .1 (06 (.42**
Engineering, No. 3584, September 21, p. 295.
The Institute of Metals : Manchester Meeting. — Some properties of tin. — Pickling and fatigue-strengt of Duralumin. — Properties of cold-worked nickel. — Elongation values of drawn copper wires. — Densiti of brass from X-ray data. — Elongation values copper and copper alloys. (5 200 words.)

1934 **621 .131 .3 (.494) & 625 .245 (.494**
Engineering, No. 3584, September 21, p. 297.
Amsler **dynamometer and inspection car.** (Swiss F deral Railways.) (2 800 words and fig.)

1934 **669 .1 (06 (.42**
Engineering, No. 3584, September 21, p. 309.
The Iron and Steel Institute in Belgium and Luxe bourg. — **Steel at elevated temperatures. Chemic resistance of special steels. Fatigue properties of p tented steel wire.** (2 900 words.)

1934 **669 .1 (06 (.42)**
ngineering, No. 3585, September 28, p. 325.
The Iron and Steel Institute in Belgium and Luxemburg. **Resistance of cast-iron to high temperatures. on-aluminium alloys. Economic exploitation of rolling ills.** (3 600 words.)

1934 **625 .244**
ngineering, No. 3585, September 28, p. 330.
JOHANSEN (F. C.). — Problems of **refrigerated ailway transport.** (3 200 words and fig.)

1934 **62 (06 (.42)**
ngineering, No. 3585, September 28, p. 335.
The British Association meeting at Aberdeen. Section . — Engineering. — **Invention and economic recovery. — Impact testing. — Inland water survey. — Stresses n overstrained materials.** (4 900 words.)

1934 **669 .1**
ngineering, No. 3585, September 28, p. 337.
The « shorter » process for **surface hardening.** (900 ords, 4 tables and fig.)

1934 **621 .94 (.42)**
ngineering, No. 3585, September 28, p. 341.
Railway **axle-journal grinding machine.** (700 words nd fig.)

1934 **62 (06 (.42)**
Engineering, No. 3586, October 5, p. 364.
The British Association. Meeting at Aberdeen. Section . — Engineering. — **The lower yield point in mild teel. — Aerial cableways. — Shear-stress distribution n reinforced-concrete beams. — Earth pressures. — Report on electrical terms and definitions.** (3 000 ords.)

1934 **62. (01 (.493) & 669 (06 (.493)**
Engineering, No. 3586, October 5, p. 367.
DUSTIN (H.). — Belgian Research Committee on he behaviour **of metals at elevated temperatures.** (5 000 ords and fig.)

1934 **621 .43 (.45)**
Engineering, No. 3587, October 12, p. 377.
The Littorina **petrol driven rail-car.** (2 200 words nd fig.)

1934 **656 .1**
Engineering, No. 3587, October 12, p. 387.
Speed on the roads. (2 600 words.)

1934 **621 .31 (.437)**
Engineering, No. 3588, October 19, p. 401.
The Trebovice **power station,** Silesia, Czechoslovakia. (3 200 words and fig.)

1934 **536 & 621 .116**
Engineering, No. 3588, October 19, p. 404.
SMALL (J.). — An electrical method of **steam** calorimetry. (2 800 words and fig.)

1934 **621 .392 (.42)**
Engineering, No. 3588, October 19, p. 407.
Arc-welded building at Messrs. Brown, Bayley's works. (2 000 words and fig.)

1934 **65**
Engineering, No. 3588, October 19, p. 420.
Workshop organisation and management. (5 400 words.)

1934 **621 .392 (.73) & 625 .232 (.73)**
Engineering, No. 3588, October 19, p. 426.
Welded coach construction on the Chicago, Milwaukee and St. Paul Railroad. (700 words and fig.)

Engineering News-Record. (New York.)

1934 **725 .33 (.73)**
Engineering News-Record, No. 12, September 20, p. 363.
TRATMAN (E. E. R.). — Flat roof for **trainshed** built under old arches. (4 300 words and fig.)

1934 **624 .62 (.71)**
Engineering News-Record, No. 12, September 20, p. 387.
High level bridge link in the Dover-Portsmouth road. (3 000 words and fig.)

Journal, Institution of Engineers, Australia. (Sydney, N. S. W.)

1934 **621 .39 (.944), 621 .86 (.944) & 651 (.944)**
Journal, Institute of Engineers, Australia, August, p. 257.
MOSS (H. P.). — Electrical features of the **mail handling plant** in the Sydney General Post Office. (11 000 words and fig.)

1934 **62. (01 & 625 .212**
Journal, Institute of Engineers, Australia, August, p. 272.
HIRST (G. W. C.). — An explanation of the development of cracks by **fatigue stresses** in the spokes of railway **carriage wheels.** (2 600 words, 3 tables and fig.)

Journal, Permanent Way Institution. (London.)

1934 **625 .1**
Journal, Perm. Way Institution, August, p. 166.
NEWLANDS (A.). — The **railway highway** (17 000 words.)

1934 **625 .18 (.42)**
Journal, Perm. Way Institution, August, p. 201.
HANSELL (W. C.). — Darlington **reclamation and refettling depot.** (6 400 words and fig.)

1934 **625 .18 (.42)**
Journal, Perm. Way Institution, August, p. 220.
BRINSMEAD (K.). — Darlington **reclamation and refettling depot. Reconditioning.** (4 300 words and fig.)

1934 **625 .143 .4**
Journal, Perm. Way Institution, August, p. 227.
KETTERINGHAM (R.). — **Rail joints and broken fishplates.** (1 600 words and fig.)

Mechanical Engineering. (New York.)

1934 **621 .392**

Mechanical Engineering, October, p. 609.

KECK (J. W.). — **Electric welding** in power-plant maintenance. (2 000 words and fig.)

1934 **536 & 621 .116**

Mechanical Engineering, October, p. 618.

Combustion triangle and soot formation. (3 000 words, 2 tables and fig.)

Modern Transport. (London.)

1934 **621 .131 .3 (.42)**

Modern Transport, No. 812, October 6, p. 3.

GRESLEY (H. N.). — **Locomotive design and construction.** — Need for national experimental station. (2 000 words.)

1934 **621 .131 .2 (.43)**

Modern Transport, No. 812, October 6, p. 4.

FLEMMING (F.). — **Streamlining of steam locomotives.** — Recent experiments in Germany. (2 000 words and fig.)

1934 **621 .43 (.44)**

Modern Transport, No. 812, October 6, p. 14.

New **articulated railcars** for French State Railway. — Twin-coach units for long-distance services. (1 100 words and fig.)

1934 **656 (.42)**

Modern Transport, No. 813, October 13, p. 3.

GARCKE (S. E.). — Progress of **passenger transport.** — A review and some conclusions. (1 900 words.)

1934 **656 .23 (.42)**

Modern Transport, No. 813, October 13, p. 4.

Railway traffic to Blackpool. — **Principles of operation.** (2 200 words and fig.)

1934 **385 .15 (.944)**

Modern Transport, No. 813, October 13, p. 5.

Experiment in **transport nationalisation.** (1 700 words.)

1934 **656 .213 (.42)**

Modern Transport, No. 813, October 13, p. 7.

Developments at Southampton Docks. — **Commercial activities in the reclaimed area.** (2 000 words and fig.)

1934 **656 .1 (.42)**

Modern Transport, No. 813, October 13, p. 8.

Reports of Area Traffic Commissions. — **Stability of industry maintained.** (1 500 words and 2 tables.)

1934 **656 .233 (.42)**

Modern Transport, No. 813, October 13, p. 9.

Pooling of railway traffic. — **Limitations in scope for economy.** (2 200 words.)

1934 **625 .162 (.42) & 656 .253 (.42)**

Modern Transport, No. 813, October 13, p. 11.

Road traffic signals at railway crossings. — Interesting installation at Hull. (1 200 words and fig.)

1934 **621 .43 (.725**

Modern Transport, No. 814, October 20, p. 5.

Diesel locomotives for Mexico. — Drewry units wit Gardner engines. (1 200 words and fig.)

1934 **621 .33 (.54**

Modern Transport, No. 814, October 20, p. 7.

Railway electrification in India. — G. I. P. schem justified by results. (1 200 words.)

Proceedings, American Society of Civil Engineers (New York.)

1934 **627 .82 & 721 .**

Proced., Amer. Soc. of Civil Engineers, Septembe p. 929.

LANE (E. W.). — Security from under-seepage ma **sonry dams** on earth foundations. (16 000 words, table and fig.)

1934 **627 .82 & 721 .**

Proced., Amer. Soc. of Civil Engineers, Septembe p. 967.

HARZA (L. F.). — Uplift and seepage **under dam on sand.** (13 500 words and fig.)

1934 **624 .**

Proced., Amer. Soc. of Civil Engineers, Septembe p. 1055.

A generalized deflection theory for **suspension brid ges.** (Discussion.) (9 000 words and fig.)

1934 **624 .6**

Proced., Amer. Soc. of Civil Engineers, Septembe p. 1080.

MANN (C. L.). — Laboratory tests of **multiple span reinforced concrete arch bridges.** (700 words an fig.)

Railway Age. (New York.)

1934 **385 .1 (.73) & 656 .23 (.73**

Railway Age, No. 14, October 6, p. 394

Railroads ask **rate increase.** (6 800 words.)

1934 **621 .13 (06 (.73) & 621 .131 .2 (.73**

Railway Age, No 14, October 6, p. 399.

Research has contributed to **locomotive fuel economy** (1 800 words.)

1934 **625 .1 (06 (.73**

Railway Age, No. 14, October 6, p. 402.

Roadmasters conclude successful **convention** at Chi cago (6 000 words and fig.)

1934 **385 .1 (.73) & 621 .133 .1 (.73**

Railway Age, No. 14, October 6, p. 437.

LOCKWOOD (R. L.). — Developments in railway **fuel studies** (2 200 words.)

1934 **625 .162 (.73**

Railway Age, No. 14, October 6, p. 409.

New form of **highway crossing protection.** (1 30 words and fig.)

Railway Engineer. (London.)

1934 **62. (01 & 669**

ilway Engineer, October, p. 299.

Some practical **X-ray** developments. (1 000 words.)

1934 **625 .113**

ilway Engineer, October, p. 300.

Measuring the **versines of curves optically.** (2 000 rds and fig.)

1934 **526 & 625 .17**

ilway Engineer, October, p. 303.

Surveying for **railway maintenance.** II. (3 300 words d fig.)

1934 **621 .132 .1 (.73)**

ilway Engineer, October, p. 306.

POULTNEY (E. C.). — **Recent American locomotive** actice. — Part II. 2-10-4 — 4-8-2 and 2-8-4 types. 200 words and fig.)

1934 **621 .392 & 624**

ilway Engineer, October, p. 313.

BONDY (O.). — Strengthening **railway bridges** by lding. (3 000 words and fig.)

1934 **621 .135 .4**

ilway Engineer, October, p. 318.

PORTER (the late S. R. M.). — The mechanics of a comotive **on curved track.** IV. Part II : Nature of slip tween tyre and rail. (2 600 words and fig.)

1934 **625 .142 .1**

ilway Engineer, October, p. 320.

BALL (J. D. W.). — Length of **sleepers** in relation gauge (1 200 words and fig.)

1934 **625 .13 (.43) & 625 .245 (.43)**

ilway Engineer, October, p. 323.

New **tunnel inspection car,** German State Ry. (1 500 rds and fig.)

1934 **621 .9 (.42)**

ilway Engineer, October, p. 324.

A triple **head facing and boring machine.** (400 words d fig.)

1934 **625 .245 (.942 + .945)**

ilway Engineer, October, p. 325.

Dynamometer car for the Victorian and South Australian Railways. (1 400 words and fig.)

Railway Engineering and Maintenance. (New York.)

1934 **625 .13 (.73)**

ilway Engineering and Maintenance, October, p. 536.

Erie waterproofs deck of history **masonry arch.** (2 100 rds and fig.)

1934 **691**

ilway Engineering and Maintenance, October, p. 541.

Meal worm pest difficult to eradicate on Chicago d North Western. (1 000 words and fig.)

1934 **624 .98**

Railway Engineering and Maintenance, October, p. 542.

Use of steel cap in **wood pile trestles.** (800 words and fig.)

1934 **625 .1 (06 (.73)**

Railway Engineering and Maintenance, October, p. 543.

Roadmasters hold Convention, September 18-20, 1934. Roadbed embankment maintenance. Report of Committee. — Permanent track construction. To what extent is the expenditure justified ?, by Robert FARIES. — Spot versus group renewal of cross ties. Report of Committee. — The conservation of rail. Report of Committee. — Highway crossing competition. Report of Committee. — Methods of cleaning stone ballast. Report of Committee. — The new goal in safety, by J. E. LONG. (40 000 words and fig.)

Railway Gazette. (London.)

1934 **385 .1 (.68)**

Railway Gazette, No. 12, September 21, p. 457.

South African Railways. — Granet Commission report. Investigation into the **financial position** and the **working** of the South African Railways. (2 200 words and fig.)

1934 **625 .2 (.68)**

Railway Gazette, No. 12, September 21, p. 459.

New South African rolling stock. **Passenger and goods stock** at present in hand or recently completed at various S. A. R. workshops. (1 200 words and fig.)

1934 **656 .213 (.42)**

Railway Gazette, No. 12, September 21, p. 461.

Extension of Parkeston Quay, Harwich, L. N. E. R. (1 800 words and fig.)

1934 **621 .131 .3 (.44)**

Railway Gazette, No. 13, September 28, p. 503.

The new French **locomotive testing station.** (1 600 words and fig.)

1934 **621 .133 .5 (.42)**

Railway Gazette, No. 13, September 28, p. 506.

The K. C. **double exhaust system for locomotives.** (300 words and fig.)

1934 **656 .1 (.44) & 656 .27 (.44)**

Railway Gazette, No. 13, September 28, p. 508.

Road and rail in France. (800 words.)

1934 **621 .133 .5 (.931)**

Railway Gazette, No. 14, October 5, p. 540.

Improved **spark arrester.** New Zealand Railways. (1 000 words and fig.)

1934 **656 .286 .3 (.42)**

Railway Gazette, No. 14, October 5, p. 542.

Automatic signalling of a heavy main line gradient. (1 000 words and fig.)

1934 **656 .212 .5 (.494)**
Railway Gazette, No. 14, October 5, p. 543.
New **marshalling yard** near Basle, Swiss Federal Railways. (1 300 words and fig.)

1934 **621 .131 .3 (.42)**
Railway Gazette, No. 14, October 5, p. 551.
Wanted a British **locomotive testing plant.** Abstract of Presidential Address delivered on September 27 before the Institution of Locomotive Engineers by Mr. H. N. Gresley C. B. E., Chief Mechanical Engineer, L. N. E. Ry. (2 300 words.)

1934 **656 .222 .1 (.73)**
Railway Gazette, No. 14, October 5, p. 554.
A record American steam run. (700 words, 1 table and fig.)

1934 **621 .132 .3 (.437)**
Railway Gazette, No. 15, October 12, p. 590.
New three-cylinder 4-8-2 express locomotive, Czechoslovak State Railways. (800 words and fig.)

1934 **656 .253 (.481)**
Railway Gazette, No. 15, October 12, p. 592.
A Norwegian **power signalling installation.** (1 700 words and fig.)

1934 **625 .162 (.42) & 656 .253 (.42)**
Railway Gazette, No. 15, October 12, p. 594.
Application of street traffic lights to railway crossings. (800 words and fig.)

1934 **621 .43 (.44)**
Diesel Railway Traction, p. 564, Supplt. to the Ry. Gazette, October 5.
French **Diesel railcar practice.** (3 200 words and fig.)

1934 **621 .43 (.43)**
Diesel Railway Traction, p. 572, Supplt. to the Ry. Gazette, October 5.
DIAMOND (E. L.). — A run with the **Flying Hamburger.** (1 500 words and fig.)

1934 **621 .43 (.4)**
Diesel Railway Traction, p. 574, Supplt. to the Ry. Gazette, October 5.
European **Diesel railcar development.** (350 words and 1 table.)

1934 **621 .43 (.43)**
Diesel Railway Traction, p. 575, Supplt. to the Ry. Gazette, October 5.
Railcars of the Reichsbahn. II. (1 200 words, 1 table and fig.)

1934 **621 .43 (.42)**
Diesel Railway Traction, p. 578, Supplt. to the Ry. Gazette, October 5.
New **twelve-cylinder Diesel engine.** (400 words and fig.)

1934 **621 .33 (.42)**
Electric Ry. Traction, p. 478, Supplt. to the Ry. Gazette, September 21.
Electrification of the Southern Railway. (2 600 words and fig.)

1934 **621 .33 (.439**
Electric Ry. Traction, p. 484, Supplt. to the Ry. Gazette September 21.
Performance of Hungarian **electric locomotives.** (1 80 words and fig.)

1934 **621 .33 (.47**
Electric Ry. Traction, p. 486, Supplt. to the Ry. Gazette September 21.
Caucasian **electric suburban railway.** (950 words an fig.)

1934 **621 .33 (.494**
Electric Ry. Traction, p. 488, Supplt. to the Ry. Gazette September 21.
Modernisation of early Swiss electrified line. (2 50 words and fig.)

Railway Mechanical Engineer. (New York.)

1934 **621 .335 (.73) & 621 .43 (.73**
Railway Mechanical Engineer, October, p. 347.
Alco builds **Diesel-electric switchers** with 600 H.-I engines. (2 700 words and fig.)

1934 **625 .234 (.73**
Railway Mechanical Engineer, October, p. 351.
New Haven installs **air-conditioning** into 69 car (1 200 words and fig.)

1934 **656 .22**
Railway Mechanical Engineer, October, p. 357.
KLEMIN (A.). — **Aerodynamics of the railway trai** (2 500 words, 2 tables and fig.)

1934 **625 .232 (.73) & 625 .235 (.73**
Railway Mechanical Engineer, October, p. 361.
All-welded light-weight Chicago, Milwaukee, St. Pa and Pacific coach. (2 000 words and fig.)

1934 **621 .131**
Railway Mechanical Engineer, October, p. 364.
LIPETZ (A. I.). — **Tractive force of steam locom tives.** (3 000 words and fig.)

The Locomotive. (London.)

1934 **621 .131**
The Locomotive, October 15, p. 300.
PHILLIPSON (E. A.). — Steam locomotive design Data and formulæ. — **Brakes.** (2 500 words and fig

1934 **621 .133**
The Locomotive, October 15, p. 305.
BREWER (F. W.). — **Locomotive regulators.** So early and modern types. (3 300 words and fig.)

1934 **621 .132 .5 (.5**
The Locomotive, October 15, p. 313.
2-8-0 locomotives, Persian Government Railway (1 100 words and fig.)

1934 625 .25 & 656 .221
ne Locomotive, October, 15, p. 323.
SHIELDS (T. H.). — Acceleration, coasting and aking in locomotive operation. (700 words.) (To be ncluded.)

Transit Journal. (New York.)

1934 625 .62 (.73)
ransit Journal, No. 10, September 15, p. 311.
TOMPKINS (R. S.). — Horse car days. (3 200 words id fig.)

1934 625 .62 (.73) & 621 .33 (.73)
ransit Journal, No. 10, September 15, p. 317.
SPRAGNE (F. J.). — Birth of the electric railway. 3 400 words and fig.)

1934 621 .33 (.73) & 625 .62 (.73)
ransit Journal, No. 10, September 15, p. 323.
HANNA (J. H.). — Changing from cable to elec- icity. (2 400 words and fig.)

1934 388 (.73)
ransit Journal, No. 10, September 15, p. 335.
RIDGWAY (R.). — Rapid Transit introduces a new ra. (3 600 words and fig.)

In Spanish.

Anales de la Asociación de Antiguos Alumnos del I. C. A. I. (Madrid.)

1934 621 .335 (.460)
nales de la Asociación de Antiguos Alumnos del I. C. A. I., Septiembre, p. 471.
JACKSON (L.) & LLANOS (S.). — Locomotoras léctricas de la Compañía de los Caminos de hierro del orte de España. (3 300 palabras & fig.) (Continuará.)

Ferrocarriles y Tranvias. (Madrid.)

1934 625 .172 (.44)
errocarriles y Tranvias, Septiembre, p. 327.
LEMAIRE (M.). — Los nuevos procedimientos de onservación de vías en los ferrocarriles franceses. (1 900 alabras & fig.)

1934 656
errocarriles y Tranvias, Septiembre, p. 334.
Legislación vigente en los principales países, en ma- eria de coordinación entre el ferrocarril y el automóvil. 16 000 palabras.)

Revista de Obras Públicas. (Madrid.)

1934 624 .63 (.460)
Revista de Obras Públicas, nº 19, 1º de Octubre, p. 361; nº 20, 15 de Octubre, p. 374.
CASADO (C. F.). — El nuevo puente de Puerta de Hierro sobre el río Manzanares, en Madrid. (3 200 palabras & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1934 621 .132 .8
Annali dei lavori pubblici, maggio, p. 398.
BAJOCCHI (U.). — Sullo scalettamento delle locomotive a dentiera. (7 000 parole & fig.) (Continua.)

La tecnica professionale. (Firenze.)

1934 621 .43 (.45)
La tecnica professionale, ottobre, p. 256.
ALBERTI (R.). — Automotrici leggere. (3 100 parole & fig.)

1934 621 .138 .5
La tecnica professionale, ottobre, p. 260.
L'approntamento dei materiali necessari per la esecuzione dei lavori di reparazione delle locomotive. (3 900 parole & fig.)

1934 621 .335 (.45)
La tecnica professionale, ottobre, p. 266.
Dati e caratteristiche delle nuove locomotive elettriche a corrente continua gr. E. 428. (1 100 parole & fig.)

L'Ingegnere. (Roma.)

1934 697
L'Ingegnere, nº 20, 16 ottobre, p. 985.
GINI (A.). — Il calcolo degli impianti di condizionamento. (5 400 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1934 625 .151 (.45) & 625 .164 (.45)
Rivista tecnica delle ferrovie italiane, 15 settembre, p. 147.
MERLINI (M.). — Il riscaldamento elettrico dei deviatoi nei piazzali ferroviari. (7 000 parole & fig.)

1934 621 .135. (01, 625 .14 (01 & 625 .2
Rivista tecnica delle ferrovie italiane, 15 settembre, p. 168.
TOCCHETTI (L.). — I veicoli ferroviari ed il binario in rapporto alle alte velocitá. (10 300 parole & fig.)

1934 **62. (01**

Rivista tecnica delle ferrovie italiane, 15 settembre, p. 201.

MENGHI (S.). — Raffronto fra le **prove di piegatura e di resilienza.** (6 000 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1934 **691 & 721 .9**

De Ingenieur, n° 40, 5 October, p. Bt. 79.

TELLEGEN (C.). — **Gewapend beton paalfundeeringen** voor zware belastingen. (3 500 woorden & fig.)

1934 **62. (01 & 624 .2**

De Ingenieur, n° 41, 12 October, p. B. 192.

FROEHLICH (O. K.). — **Drukverdeeling** in een alzijdig onbegrensd elastischisotroop lichaam, veroorzaakt door een puntlast. (1 800 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1934 **385 .62 & 385 .63**

Spoor en Tramwegen, n° 22, 23 October, p. 579.

ELIAS (P.). — Iets over de te Rome gehouden Conferentie tot herziening van de **Internationale Overeenkomsten omtrent het vervoer per spoorweg van goederen** (C. I. M.) en van reizigers en bagage (C. I. V.). (3 400 woorden.)

1934 **621 .134 .2 & 621 .134 .3**

Spoor en Tramwegen, n° 22, 23 October, p. 587.

TABERNAL (W. F. H. J.). — Het regelen van **stoomschuifbewegingen.** (3 000 woorden & fig.)

In Portuguese.

Revista das Estradas de ferro. (Rio de Janeiro.)

1934 **656 .1**

Revista das Estradas de ferro, n° 221, 30 de setembro, p. 625.

Ferrovia o rodovia ? (2 300 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

ANALYTICAL TABLE OF ARTICLES

ARRANGED ACCORDING TO THE DECIMAL CLASSIFICATION

(1934)

	Month.	Page.
0. General works. Bibliography, Cyclopedias, Dictionaries, etc.		
Deutsche Gesamtausgabe der Dezimalklassification *(Complete German edition of the decimal classification)*. Published by the GERMAN STANDARDISATION COMMITTEE. *(New publication.)*	May.	514
3. Sociology in General.		
313. Statistics on special topics.		
313 : 385. General railway statistics.		
Les Grands Réseaux de chemins de fer français, année 1933 *(The French Main Line Railways, 1933)*, by R. GODFERNAUX. *(New book.)*	October.	1133
313 : 625 .143.3. Statistics of rail breakages.		
Statistics of rail breakages for the year 1932 :		
Part I	February.	176
Part II	April.	379
385. Railways from a general, economic and financial point of view.		
Mission et régime des chemins de fer dans l'économie nationale. Contribution à l'étude du problème de la concurrence entre le chemin de fer et l'automobile *(The mission and regime of railways in the national economy. A contribution to the study of the problem of competition between rail and road)*, by Manuel SAITZEW. *(New book.)*	February.	193
El problema de los Ferrocarriles Españoles, 1933 *(The Spanish Railway Question, 1933)*. *(New book.)*	»	192
385. (01. Railways in new countries.		
Railways and Roads in Pioneer Development Overseas : A Study of their comparative economics, by J. Edwin HOLMSTROM. *(New book.)*	September.	1002
385. (02. Railway handbooks, treatises, etc.		
Cours d'exploitation des chemins de fer. Tome I : Exploitation commerciale *(Railway operating course.* Vol. I : *Commercial operating)*, 3rd edition, by U. LAMALLE. *(New book.)*	October.	1132

	Month.	Page
Stationsverzeichnis der Eisenbahnen Europas *(früher : Dr. Koch's Stationsverzeichnis)*. — List of European railway stations *(formerly Dr. Koch's List of Stations)*, published by the VEREIN MITTELEUROPÄISCHER EISENBAHNVERWALTUNGEN *(Union of Central European Railway Administrations)* *(New publication.)*	October.	1135
385. (06. Societies, associations, scientific congresses.		
385. (06.111. International Railway Congress Association. Official documents.		
Meeting of the Permanent Commission, held on the 7th July 1934. *Appendix :* List of members of the Permanent Commission of the International Railway Congress Association	»	1136
385. (09. History and description of railways.		
COMPANIA DE LOS FERROCARRILES DE MADRID A ZARAGOZA Y A ALICANTE. — Reseña historica de su constitución y desarrollo. Actuación de la Compañia durante los últimos veinte años (1913-1931). [*Madrid-Saragossa and Alicante Railways Company. Historical review of its foundation and development. The Company's activities during the last twenty years (1913-1931).*] *(New book.)*	January.	103
A Hundred Years of Inland Transport (The Hundred Years series, 1830-1933), by C. E. R. SHERRINGTON. *(New book.)*	September.	1003
385. (092. Biographies. Obituary notices.		
Obituary : The Right Hon. VISCOUNT CHURCHILL	February.	195
Gaston GRIOLET	May.	517
Sir Frederic PALMER	July.	771
Georges MOLLE	August.	882
José GAYTAN de AYALA	November.	1267
385. 1 Railways from a financial point of view. Their effect on a country's finances.		
The world crisis and railways : Effects of the crisis on railway working and measures taken to lessen these effects, etc. :		
Report covering main-line railways except those affiliated to the International Railway Union (U. I. C.), by Mr. ASHTON DAVIES	June.	525
Report covering main-line railways affiliated to the International Railway Union (U. I. C.), by Dr. COTTIER and Herr von BECK	December.	1277
L'amortissement industriel dans les Compagnies de Chemins de fer *(Commercial amortisation applied to railway companies)*, by E. M. FALLET . . .	August	880
385 .11. Cost of construction and revenue derived.		
385 .113. Working results.		
Les Grands Réseaux de Chemins de fer français, année 1933 *(The French Main Line Railways, 1933)*, by R. GODFERNAUX. *(New book.)*	October.	1133

	Month.	Page.
385 .5. Staff.		
385 .52. Wages and salaries.		
385 .524. Profit-sharing. Bonuses to the staff.		
Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits (Question X, 12th Congress). Discussion	March.	199
Fuel consumption on Austrian Railways. The coal bonus system, by Fr. STRAUSS	July.	762
385 .58. General matters concerning the staff.		
385 .587. Division and organisation of labour.		
Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits (Question X, 12th Congress). Discussion	March.	199
Reorganisation of the Malines main repair shops (Belgian National Railways Company), by A. VERBEEMEN	August. November.	785 1179
385 .6. International agreements relating to railways.		
385 .63. International agreements as to the carriage of goods by railway.		
List of stations on the railways to which the International Convention of October 23rd, 1924, on the carriage of goods by railway (C. I. M.) applies. Published by the HEADQUARTERS OFFICE FOR THE INTERNATIONAL CARRIAGE OF GOODS TRAFFIC BY RAILWAY, BERNE. *(New publication.)* . . .	June.	641
6. Useful Arts.		
62. Engineering.		
62. (01. Strength of materials. Physical tests.		
Second International Day on Rails (Zurich, 15-16 June, 1932). — Report No. 16 of the Swiss Association for Testing Materials. — Report No. 43 of the Federal Materials Testing Laboratory. — Published by the SWISS ASSOCIATION FOR TESTING MATERIALS, Zurich. *(New publications.)*	May.	515
Non-destructive testing methods as applied to bridges. Use of radiography, by W. ROSTECK	June.	585
X-ray determination of depth of cold working by machining, by L. THOMASSEN and D. M. Mc CUTCHEON	September.	934
Working stresses for high-temperature service, by P. G. Mc VETTY . . .	■	958
621. Mechanical and electrical engineering.		
621 .1. Steam engineering.		
621 .13. Locomotive engines.		
Recent Italian locomotives	July.	764
621 .131. Theory of the steam locomotive.		

	Month.	Page.
621 .131.2. Investigation of the conditions to be fulfilled in building a locomotive.		
Ratios of modern locomotives, by A. I. LIPETZ	April.	324
Ratios of modern locomotives, by H. S. VINCENT	»	351
621 .132. Various classes of locomotive.		
621 .132.3. Passenger train locomotives with 4 or more coupled wheels.		
Two-cylinder simple expansion 4-6-2 express locomotives for the Alsace-Lorraine Railways	February.	161
New 2-10-0 four-cylinder compound locomotives for fast and heavy goods and passenger trains, Nord Railway, France	May.	492
New 2-8-2 express passenger locomotive for the London and North Eastern Railway	June.	626
The altered « Pacific » type locomotive No. 231-F-141 of the Paris-Lyons-Mediterranean Railway, by E. SPIESS	July.	717
High-speed streamlined steam locomotives designed by Henschel & Sohn	»	746
Compound locomotive converted to simple on the Nord Railway, France	»	759
Recent American express locomotives, by E. C. POULTNEY	August.	830
London and North Eastern Railway 3-cylinder 8-coupled passenger locomotive (Cock o' the North)	November.	1218
New 3-cylinder 2-6-4 tank locomotives and 4-6-0 express locomotives for the London Midland and Scottish Railway	»	1243
621 .132.5. Goods train locomotives with 6 or more coupled wheels.		
New 2-10-0 four-cylinder compound locomotive for fast and heavy goods and passenger trains, Nord Railway, France	May.	492
4-8-4 type fast freight locomotives, Lehigh Valley Railroad, by E. C. POULTNEY	July.	705
Paris-Lyons and Mediterranean Railway Company's new 2-10-2 (class 151. A) goods locomotives developing 3 000 drawbar horse power, by A. PARMANTIER	September.	915
621 .132.6. Tank locomotives.		
New 3-cylinder 2-6-4 tank locomotives and 4-6-0 express locomotives for the London Midland and Scottish Railway	November.	1243
621 .132.7. Shunting locomotives.		
150-B.H.P. Diesel-geared shunting locomotive, London Midland and Scottish Railway	May.	508
621 .132.8. Special types. Railcars, etc.		
The use of rail motor cars on secondary railway lines (Question XIII, 12th Congress). Discussion	March.	282
The « Franco » locomotive	April.	374
The new internal-combustion-engined railcars of the French State Railways, by Henry MARTIN	May.	469
A multi-engined steam locomotive	November.	1228
621 .133. Production of steam in locomotives.		
621 .133.1. Fuel. Combustion. Fuel consumption.		
Mechanisation of the control of the fuel used and the distance run by locomotives. The « Rona » locomotive meters, by N. M. MOTCHAROFF and A. S. SOKOLOFF	March.	293
Fuel consumption on Austrian Railways. The coal bonus system, by Fr. STRAUSS	July.	762

	Month	Page.
621 .133.4. Smoke box and chimney.		
Soo line tests Cyclone front end	February.	153
Locomotive smoke box conditions	June.	597
621 .133.5. Exhaust.		
Soo line tests Cyclone front end	February.	153
Locomotive smoke box conditions.	June.	597
621 .134. The steam engine.		
621 .134.1. Driving mechanism.		
Duralumin connecting rods, French Est Railway	August.	872
621 .134.4. Compounding.		
Compound locomotive converted to simple on the Nord Railway, France	July.	759
621 .135. Vehicle of the locomotive.		
621 .135.1 Underframe, attachment to the boiler, cab, etc.		
A clear engine cab outlook	April.	400
621 .135.4. Lateral play on curves. Bogies, bissel trucks, etc.		
Transition curves. Diagrams giving lengths of transitions, safe speeds, and overturning speeds, by P. H. JACKSON	November.	1211
621 .137. Locomotive working.		
A clear engine cab outlook	April.	400
621 .138. Laying up and maintaining the locomotives.		
621 .138.1. Running sheds.		
Pneumatic ash extraction plant on the London Midland & Scottish Railway	February.	172
621 .138.3. Current maintenance.		
Spray cleaning of locomotives on the London & North Eastern Railway	May.	510
621 .138.5. Repair shops.		
Note on the preparation of locomotive repair programmes, by Dr.-Ing. Fr. LANDSBERG	April.	309
Reorganisation of the Malines main repair shops (Belgian National Railways Company), by A. VERBEEMEN	August. November.	785 1179
Die Bedeutung einer planmässigen Erhaltungswirtschaft beim Fahrzeugpark für die Deutsche Reichsbahn *(The importance from the point of view of the German Reichsbahn of well organised rolling stock maintenance methods)*, by Dr.-Ing. Peter KÜHNE. *(New book.)*	August.	880
Welding in the construction of goods wagons, passenger coaches, locomotives and railcars, by Otto BONDY	September.	967
Welded locomotives parts, London Midland and Scottish Railway	"	999

	Month	Page.
621 .3. Electrical engineering.		
621 .33. Electric railways and tramways. Railway electrification.		
Opening of the electrification of the Orleans to Tours line, on the 19th July, 1933, by J. DUMAS	February.	123
Italian railway electrification	November.	1249
621 .335. Electric locomotives and railcars.		
High-power Sulzer Diesel locomotives for express passenger trains and for goods trains	February.	157
Diesel-electric streamlined rail coach	»	165
German high-speed electric locomotive	April.	398
200-H. P. Diesel-electric railcars, London Midland & Scottish Railway	May.	483
Armstrong-Whitworth 880-H. P. oil-electric locomotive for experimental use on the London & North Eastern Railway	»	487
Possibilities of high-speed with streamlined Diesel trains	June.	605
Union Pacific installs light-weight high-speed streamlined passenger train	July.	728
410-H.-P. Diesel-electric articulated express railcar of the Belgian National Railways Company	»	749
Recent Italian locomotives	»	764
64-B.H.P. Henschel petrol loco-tractors with electric transmission on the Gebus system	»	766
Burlington « Zephyr » completed at Budd plant. First Diesel-propelled articulated train of stainless-steel construction for high-speed service	August.	852
German railcar with 330-B. H. P. twelve-cylinder Mercedes-Benz Diesel engine	»	868
1 100-B.H.P. Diesel-electric high-speed train units for the Danish State Railways	»	874
920-H.P. Diesel-electric locomotive for the Paris-Lyons and Mediterranean Company's Algerian Lines	September.	980
Diesel-electric locomotive layouts	»	988
621 .39. Miscellaneous uses of electricity (Braking, welding, lighting, heating, etc.).		
Electric heating of railway carriages for international trains	June.	639
621 .392. Electric welding.		
A portable Diesel-electric welding plant	July.	769
Welding in the construction of goods wagons, passenger coaches, locomotives and railcars, by Otto BONDY	September.	967
Repairing cast manganese crossings by welding, London and North Eastern Railway, by F. E. HARRISON	»	998
Welded locomotive parts, London Midland & Scottish Railway	»	999
621. 4. Air and gas engines and other motors.		
621 .43. Ignited gas engines. Internal combustion motors. Petrol motors.		
130-H. P. oil engine-driven railcar for the Great Western Railway (Gt-Bn.)	February.	129
Transmissions for Diesel locomotives and railcars (Lysholm-Smith, Vickers-Coats, Vulcan Sinclair), by STUART MIALL	»	140
High-power Sulzer Diesel locomotives for express passenger trains and for goods trains	»	157

	Month.	Page.
Diesel-electric streamlined rail coach	February.	165
Italian petrol rail cars	»	168
Automotores para ferrocarriles con motor de combustion interna *(Rail motor cars with internal combustion engines)*, by E. SANTIAGO PUERTAS. *(New book.)*	April.	404
The new internal-combustion-engined railcars of the French State Railways, by Henry MARTIN	May.	469
200-H. P. Diesel-electric railcar, London Midland & Scottish Railway	»	483
Armstrong-Whitworth 880-H. P. oil-electric locomotive for experimental use on the London & North Eastern Railway	»	487
150-B. H. P. Diesel-geared shunting locomotive, London Midland & Scottish Railway	»	508
The London Midland & Scottish Railway Company's light Diesel-hydraulic railcars for branch line service	»	499
The world's largest locomotive Diesel engine (Busch-Sulzer designs developing 1 600, 2 000 and 3 500 B. H. P.)	June.	600
Possibilities of high speed with streamlined Diesel trains	»	605
A successful hydraulic drive. The Voith-Sinclair turbo-converter	»	611
The new Diesel railcar with two motor bogies, built by Messrs. de Dietrich and Co.	»	631
1 000-B. H. P. directly-driven Deutz-Diesel locomotive	»	634
The Krupp hydraulic clutch applied to a 1 450-B. H. P. locomotive of the Boston and Maine Railroad	»	637
Union Pacific installs light-weight high-speed streamlined passenger train	July.	728
410-H. P. Diesel-electric articulated express railcar of the Belgian National Railways Company	»	749
64-B. H. P. Henschel petrol loco-tractors with electric transmission on the Gebus system	»	766
Burlington « Zephyr » completed at Budd plant. First Diesel-propelled articulated train of stainless-steel construction for high-speed service	August.	852
German railcar with 330-B. H. P. twelve-cylinder Mercedes-Benz Diesel engine	»	868
1 100-B. H. P. Diesel-electric high-speed train units for the Danish State Railways	»	874
72/85-B. H. P. Dutch Diesel-electric tractors	»	876
920-H. P. Diesel-electric locomotive for the Paris-Lyons and Mediterranean Company's Algerian Lines	September.	980
Diesel-electric locomotive layouts	»	988
High-speed streamlined Bugatti railcars on the Paris-Lyons and Mediterranean Railways	»	993
Rail motor cars from the point of view of their construction. — A. *Types of engines. Forms of transmissions. Running gear. Brakes.* Report covering the countries of the European Continent, by L. DUMAS and Jean LEVY	October.	1013

624. Bridges and framework.

624 .(0. General matters. Characteristics of materials used in building bridges and framework.

Aluminum enters bridge construction at Pittsburgh, by Chas. M. REPPERT	May.	460
Non-destructive testing methods as applied to bridges. Use of radiography, by W. ROSTECK	June.	585

	Month.	Page.
624 .6. Arched bridges.		
624 .63. Concrete arched bridges.		
Some reinforced concrete structures on the Belgian National Railways, by R. DESPRETS	November.	1153
624 .7. Composite structures.		
Canadian National constructs another unusual concrete bridge	September.	909
625. Railway and road engineering.		
625 .1. Way and works.		
625 .11. Scheme for a railway.		
625 .113. Longitudinal section. Gradients. Curves.		
Railway Curves. The accuracy of the method of adjusting curves by correction of the versines, by Mr. CHAPPELLET	February.	105
Progressive transition curves on railways, by Carlos LAFFITTE-MARTINEZ	»	117
Transition curves. Diagrams giving lengths of transitions, safe speeds and overturning speeds, by P. E. JACKSON	November.	1211
625 .12. Roadbed.		
625 .122. Construction and strengthening of formation and embankments.		
Remaking and blanketting clay formations under main lines in service, by Mr. GIRAL	August.	822
625 .14. Permanent way.		
625 .143. Rails and their fastenings.		
Second International Day on Rails (Zurich, 15-16 June 1932). — Report No. 16 of the SWISS ASSOCIATION FOR TESTING MATERIALS. — Report No. 43 of the FEDERAL MATERIALS TESTING LABORATORY. Published by the SWISS ASSOCIATION FOR TESTING MATERIALS, ZURICH. *(New publications.)*	May.	515
625 .143.2. Quality of metal for rails. Specifications. Manufacturing conditions. Tests.		
The burden of defective rails, by C. J. ALLEN	April.	367
Evolution of wear-resisting rails. The martensitic rail of the Eisenwerkgesellschaft Maximilianshütte, by Cecil J. ALLEN	August.	825
The steel rail specification of the American Railway Engineering Association, by Cecil J. ALLEN	September.	905
625 .143.3. Rail wear and breakages.		
The burden of defective rails, by C. J. ALLEN	April.	367
Evolution of wear-resisting rails. The martensitic rail of the Eisenwerkgesellschaft Maximilianshütte, by Cecil J. ALLEN	August.	825
Rail and flange lubrication. A review of the problem, the devices available to meet it, and the economies possible, by D. M. CLARKE	November.	1260

	Month.	Page.
625 .15. Track appliances. Points and crossings.		
Repairing cast manganese crossings by welding, London and North Eastern Railway, by F. E. HARRISON	September.	998
625 .17. Permanent way, maintenance and renewal.		
Modern methods and appliances used in track maintenance on the London and North Eastern Railway	»	996
625 .173. Repairs and renewal.		
Remaking and blanketting clay formations under main lines in service, by Mr. GIRAL	August.	822
625 .2. Railway rolling stock.		
Unificación del material ferroviario *(Standardisation of railway rolling stock)*, by D. Antonio MENDOZA VILAR. *(New book.)*	April.	405
625 .21. Principal parts of the vehicle.		
625 .212. Axles, wheels, tyres, etc.		
Rail and flange lubrication. A review of the problem, the devices available to meet it, and the economies possible, by D. M. CLARKE	November.	1260
625 .214. Axle boxes and axle guards. Lubricants.		
Roller bearings in rail transport. Application to locomotives and wagons, by P. A. HYDE	May.	495
625 .215. Bogies and bissel trucks. Radial and convergent axles.		
New design of carriage bogie on the J. G. Brill system	July.	755
Transition curves. Diagrams giving lengths of transitions, safe speeds and overturning speeds, by P. E. JACKSON	November.	1211
625 .216. Buffers and couplings.		
Automatic couplers on French Railways. Recent applications of Willison couplers	June.	627
625 .23. Passenger coaches.		
Wind flume experiments on the atmospheric resistance of railway vehicles, by G. VOGELPOHL	September.	939
625 .232. Corridor carriages, sleeping cars, dining cars, etc.		
New light-weight Italian coaches. Steel-framed vehicles incorporating aluminium wherever possible	November.	1264
625 .234. Train heating and ventilation.		
General-Electric air conditioning for Pennsylvania diner, by T. F. PERKINSON and F. L. SAHLMANN	February.	148
Electric heating of railway carriages for international trains	June.	639
625 .26. Carriage and wagon repair shops.		
Reorganisation of the Malines main repair shops (Belgian National Railways Company), by A. VERBEEMEN	August. November.	785 1179

	Month.	Page.
Die Bedeutung einer planmässigen Erhaltungswirtschaft beim Fahrzeugpark für die Deutsche Reichsbahn *(The importance, from the point of view of the German Reichsbahn, of well organised rolling stock maintenance methods)*, by Dr.-Ing. Peter KÜHNE. *(New book.)*	August.	880
Welding in the construction of goods wagons, passenger coaches, locomotives and railcars, by Otto BONDY	September.	967
625 .6. Light railways. Tramways.		
625 .61. Light railway engineering.		
625 .61 (0. General matters.		
Co-ordination of operation as between heavy and light railways (Question XII, 12th Congress). Discussion	March.	264
625 .616. Motive power of light railways.		
The use of rail motor cars on secondary railway lines (Question XIII, 12th Congress). Discussion	»	282
656. Transportation. Rail and road transport.		
Competition between or joint working of railways and airways, or railways and roadways. An investigation from the technical, commercial and contractual points of view (Question XI, 12th Congress). Discussion	»	235
Competition by roads, waterways and airways:		
I. Netherlands. Jugoslavia. Poland	June.	519
II. Portugal. Hungary. French West Africa	July.	643
III. France. Sweden. Egypt. India	August.	773
IV. Belgium. France. Japan. Argentina. India. Kenya and Uganda	September.	885
V. Germany. Austria	October.	1005
VI. Great Britain (Road-Rail Traffic Act, 1933)	November.	1145
VII. Italy. India. Mozambique. Indo-China	December.	1169
The world crisis and railways: Effects of the crisis on railway working and measures taken to lessen these effects, etc.:		
Report covering main-line railways except those affiliated to the International Railway Union (U. I. C.), by Mr. ASHTON DAVIES	June.	525
Report covering main-line railways affiliated to the International Railway Union (U. I. C.), by Dr. COTTIER and Herr von BECK	December.	1277
Railways and aviation. Possible consequences of joint action with Imperial Airways, by T. STANHOPE SPRIGG	August.	877
656 .1. Road transport.		
Transporting rail wagons by road in Germany	February.	169
RAILWAY AND ROAD TRANSPORT. — Memorandum by the BOARD OF DIRECTORS AND THE GENERAL MANAGEMENT OF THE SWISS FEDERAL RAILWAYS on the Regulation of the relations between railways and road motor transport (26th June 1933). *(New book.)*	March.	307
I problemi attuali dei trasporti terrestri *(Present-day inland transport problems)*. A publication issued by the CONFEDERAZIONE NAZIONALE FASCISTA DELLE IMPRESE DI COMUNICAZIONI INTERNE	October.	1134

656 .2. Carriage by railway. Railway working.	Month.	Page.
RAILWAY AND ROAD TRANSPORT. — Memorandum by the BOARD OF DIRECTORS AND THE GENERAL MANAGEMENT OF THE SWISS FEDERAL RAILWAYS on the Regulation of the relations between railways and road motor transport (26th June 1933). *(New book.)*	March.	307
A British Railway behind the Scenes, by J. W. WILLIAMSON. *(New book.)*	April.	404
I problemi attuati dei trasporti terrestri *(Present-day inland transport problems).* — A publication issued by the CONFEDERAZIONE NAZIONALE FASCISTA DELLE IMPRESE DI COMUNICAZIONI INTERNE	October.	1134
656 .2 (02. Handbooks. Treatises, etc.		
Cours d'exploitation des chemins de fer. Tome I: Exploitation commerciale. *(Railway operating course.* Vol. I: *Commercial operating),* 3rd edition, by U. LAMALLE. *(New book.)*	»	1132
656 .21. Station working.		
656 .212. Goods station arrangements.		
Organisation for carrying small consignments of goods and the most suitable methods for their delivery with the least delay. Use and selection of fixed and mechanical transhipping plants. (Question VIII, 12th Congress.) Discussion	January.	24
656 .22. Trains.		
656 .221. Power required to haul-trains. Air resistance.		
Wind flume experiments on the atmospheric resistance of railway vehicles, by G. VOGELPOHL	September.	939
656 .222. Train working.		
656 .222.1. Speed and load.		
Note on Train Speeds (Part II: Train speeds and services in different countries — *Continued*), by Lionel WIENER:		
Great Britain *(concluded)*	January.	63
France	May.	407
France *(concluded)*	June.	561
The International Sleeping Car Company	July.	653
656 .223. Use and distribution of rolling stock.		
656 .223.2. Use and distribution of goods stock.		
Allocation of freight rolling stock. Investigation into the turn-round of goods vehicles. Separation of the elements included in it. Methods of reducing the period of turn-round. (Question VII, 12th Congress.) Discussion	January.	3
656 .225. Goods services. Grouping of consignments.		
Organisation for carrying small consignments of goods and the most suitable methods for their delivery with the least delay. Use and selection of fixed and mechanical transhipping plants. (Question VIII, 12th Congress.) Discussion	»	24
The Container, *Bulletin of the International Container Bureau* (International Chamber of Commerce) (1st Number)	June.	642

	Month.	Page.
656 .23. Traffic and rates.		
656 .235. Rates and conditions for carrying goods.		
Eisenbahn Gütertarifwesen *(Railway goods rates)*, by E. ADOLPH. *(New book.)*	May.	514
656 .25. Safety precautions. Signals.		
656 .25 (0. General matters. General regulations.		
American Railway Signaling Principles and Practices. — Chapter III : Principles and economic phase of signaling. — Chapter XIX : Electric interlocking —, by the AMERICAN RAILWAY ASSOCIATION, SIGNAL SECTION. *(New publications.)*	»	513
656 .253. Fixed and station signals.		
Battery-operated colour-light signals on the London and North Eastern Railway	January.	95
656 .254. Apparatus for communicating information at long distances. Alarm bells and special warnings. Telegraph. Telephone. Communication between stations and trains in motion. Various systems of working. Train dispatchers. Covering break-downs.		
Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. (Question IX, 12th Congress.) Discussion	»	39
Centralised traffic control on the French State Railways between Houille and Sartrouville (Seine-et-Oise)	June.	616
Automatic train control in Switzerland. The Signum inductive system adopted as standard for the Federal Railways	»	623
656 .257. Combined working of signals and points. Direct interlocking.		
American Railway Signaling Principles and Practices. — Chapter III : Principles and economic phase of signaling. — Chapter XIX : Electric interlocking —, by the AMERICAN RAILWAY ASSOCIATION, SIGNAL SECTION. *(New publications.)*	May.	513
656 .258. Indirect interlocking.		
American Railway Signaling Principles and Practices. — Chapter III : Principles and economic phase of signaling. — Chapter XIX : Electric interlocking —, by the AMERICAN RAILWAY ASSOCIATION, SIGNAL SECTION. *(New publications.)*	»	513
656 .26. Ancilliary services.		
656 .261. Collection and delivery.		
Transporting rail wagons by road in Germany	February.	169
657. Book keeping. Accounts.		
L'amortissement industriel dans les Compagnies de Chemins de fer *(Commercial amortisation applied to railway Companies)*, by E. M. FALLET . . .	August.	880

	Month,	Page.
669. Metallurgy and assaying.		
Aluminum enters bridge construction at Pittsburgh, by Chas. M. REPPERT . .	May.	460
Duralumin connecting rods, French Est Railway	August.	872
X-ray determination of depth of cold working by machining by L. THOMASSEN and D. M. Mc CUTCHEON	September.	934
Working stresses for high-temperature service, by P. G. Mc VETTY . . .	»	958
669 .1. Iron and steel.		
Fabrication de l'acier au convertisseur basique. Scorie Thomas *(The manufacturing of steel by the Thomas (basic) converter. Basic slag)*, by M. LAFFARGUE. *(New book.)*	June.	64
69. Building.		
693. Materials. Processes. Preservatives.		
Torkretnicwo. Betonowanie pod cisnieniem sprezonego powietrza i jego zastosowanie w budownictwie *(Work carried out by means of the cement gun)*, by T. J. KALKOWSKY. *(New book.)*	September.	1004

VOL. XVI — N° 12

DECEMBER 1934

Monthly Bulletin of the International Railway Congress Association

(English Edition)

THE LIBRARY OF THE
JAN 2 1935
UNIVERSITY OF ILLINOIS

ECONOMISE...

BY USING

WESTINGHOUSE

STEAM HEATING

ECONOMISE IN INSTALLATION.

Installation is simplified by the use of the Patent Bowden Wire Control, which enables the handle to be placed in any convenient position, and eliminates all rods, cranks, etc.

ECONOMISE IN OPERATION.

The steam is always at atmospheric pressure, and is automatically cut off when the temperature determined by the position of the passengers' control handle is reached.

ECONOMISE IN SERVICE.

The ribbed heater gives two-and-three-quarter times more heating surface than a plain tube of the same diameter.

ECONOMISE IN MAINTENANCE.

The heaters are entirely of metal. There are no diaphragms which may require attention or renewal. The patent quadrant adjustment enables temperature regulation to be made through one adjusting nut. The usual simple adjustments are provided for the Bowden Wires.

The Westinghouse Brake & Saxby Signal Co. Ltd.

82 YORK RD., KING'S CROSS, LONDON, N.1

Level Crossing Protection

Photo by Courtesy of « Modern Transport », shows new installation at Walton Street, Hull, L. & N. E. R., of level crossing gates, and road signals

Safety for level crossings is ensured by the use of

WESTINGHOUSE

APPARATUS

Such as **GATES**, Single or double Span, wood or iron, operated mechanically or by the Westinghouse Oil-vane point machine.

BARRIERS, mechanical lifting type, wood or iron, or electrically operated « EQUINETIC » lifting type.

FLASHING LIGHT AND ROAD CROSSING SIGNALS

together with relays, batteries, control apparatus, etc., etc.

The Westinghouse Brake & Saxby Signal Co. Ltd.,
82, York Road, King's Cross, London, N. 1.

Represented in India by Saxby & Farmer (India) Ltd Calcutta and Bombay
In Australia by McKenzie & Holland (Australia) Pty, Ltd. Melbourne and Brisbane

WESTINGHOUSE

METAL RECTIFIERS

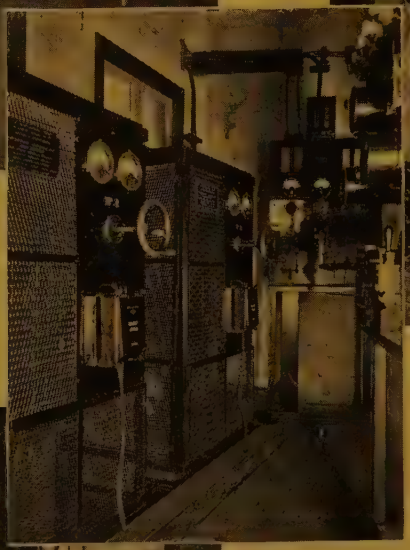
are now very widely used

FOR RAILWAY SERVICE

Their permanence and reliability, the absence of moving parts and fragile filaments, etc., make them particularly suitable for most purposes where D. C. is required from A. C. mains

A

B



C

D

A L. M. & S. Rly Carrier Telephone Scheme, battery charger 33-v, 12-a; and 180-v, 0-6 a at Warrington.

B L. & N. E. Rly Rectifier charging tripping battery at Stratford Power House.

C S. Rly Brighton. Rectifiers for charging point operation batteries.

D L. M. & S. Rly point machine rectifiers at St. Enoch. Glasgow.

WHERE RELIABILITY IS ESSENTIAL USE WESTINGHOUSE METAL RECTIFIERS

Made in England by

THE WESTINGHOUSE BRAKE & SAXBY SIGNAL Co Ltd.

82, York Road, King's Cross, LONDON N. 1.

VEREINIGTE EISENBAHN-SIGNALWERKE G. M. B. H. BERLIN-SIEMENSSTADT

Semi-Automatic Power Frame at the Station "Ausstellung", Berlin

The most northerly Power Frame in the World at Narvik (Norway)

MECHANICAL INTERLOCKING FRAMES

Signal and Point Mechanisms for Wire and Rod Working — Compensators for Wire Transmissions — Point Detectors — Time Locks — Level Crossing Barriers — Electric Slots on Signal Arms — Crank Handle Locking Frames — Lever Locking Frames — Rail-Contacts

ELECTRIC INTERLOCKING FRAMES

with German and American Pattern Locking Boxes — Signal and Point Machines for Direct or Alternating Current — Electric Point Detection — Motor operated Detector Bolts — Semaphore Signals — Day Colour Light Signals

BLOCK SIGNALLING, NON-AUTOMATIC

Block Signals — Block Instruments — Electric Plunger Locks for Block Instruments — Track Circuiting and other apparatus for indicating the condition of the line

AUTOMATIC BLOCK SIGNALLING

Impedance Bonds — Track Relays — Illuminated Track Diagrams — Level Crossing Signals

AUTOMATIC GRAVITY HUMP YARD INSTALLATIONS

Desk Pattern Power Locking Frames — Magazine Apparatus for Automatic Point Operating

AUTOMATIC TRAIN CONTROL

mechanical (Train Stops) — inductive

VES

WORKS IN BERLIN-SIEMENSSTADT, BRAUNSCHWEIG, BRUCHSAL, GEORGSMARIENHÜTTE

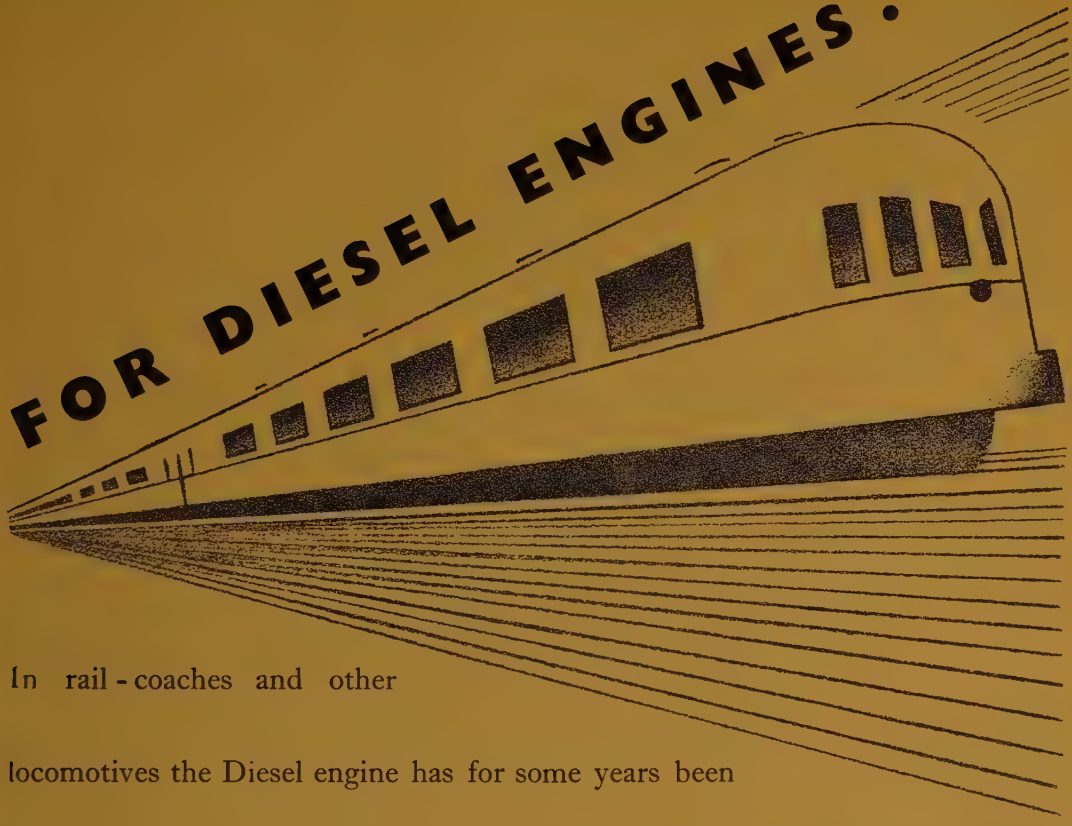
High Pressure Steam
-and the Lubrication Problem

THE L.N.E.R. 4- CYLINDER COMPOUND EXPRESS LOCOMOTIVE depicted above, fitted with high pressure Yarrow-Gresley boiler, is equipped with WAKEFIELD No 7 pattern Mechanical Lubricators for valves, cylinders and axleboxes. One of the principal and most difficult problems associated with the use of steam at very high pressures in locomotives is that of lubricating the cylinders and piston valves; whilst for heavily loaded bearings forced lubrication has become a necessity. WAKEFIELD'S Mechanical Lubricators adequately meet both requirements.

C. C. WAKEFIELD & CO., LTD.

WAKEFIELD HOUSE, 30-32, CHEAPSIDE, LONDON, E. C. 2

FOR DIESEL ENGINES . . .



In rail-coaches and other locomotives the Diesel engine has for some years been invading the realms of steam power. The Vacuum Oil Company has been associated with this development from the first. The knowledge and experience of its specialists are at the disposal of those who buy the lubricants for locomotives of this type.

GARGOYLE

REGD TRADE MARK

LUBRICANTS

VACUUM OIL COMPANY LIMITED • HEAD OFFICE: CAXTON HOUSE WESTMINSTER, LONDON, S.W.1 • WORKS: BIRKENHEAD AND WANDSWORTH

RAILWAY MATERIALS

TYRES AND AXLES
LAMINATED AND COIL SPRINGS
SPIRAL AND VOLUTE SPRINGS
BUFFERS
SPRING STEELS
DAVIS STEEL WHEELS
WHEEL CENTRES
BOGIE SIDE FRAMES
LOCO DRAG BOXES
PISTON RODS
SLIDE BARS
CRANK PINS, ETC.

THOS. FIRTH & JOHN BROWN, LTD

ATLAS & NORFOLK WORKS, SHEFFIELD.

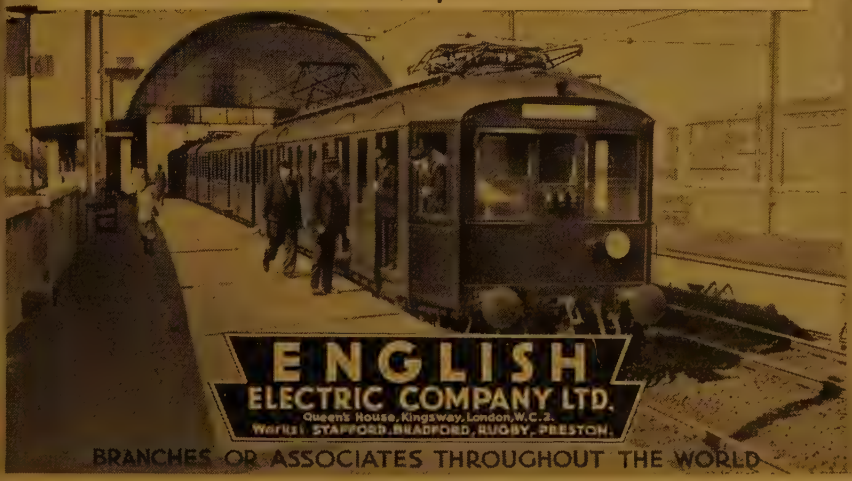
Dickson

RAILWAY ELECTRIFICATION THROUGHOUT THE WORLD

57 RAILWAYS IN 18 COUNTRIES HAVE ADOPTED 'ENGLISH ELECTRIC' TRACTION EQUIPMENTS

GT. BRITAIN	6	DENMARK	1	JAPAN	26	POLAND	1
ARGENTINA	1	FRANCE	3	MOROCCO	1	S. AFRICA	1
AUSTRALIA	1	HOLLAND	1	NEW ZEALAND	2	SPAIN	2
BRAZIL	1	INDIA	3	PERU	1	URUGUAY	1
CANADA	3					VENEZUELA	2

Complete Railway Electrification Schemes Undertaken in any part of the World



ENGLISH ELECTRIC COMPANY LTD.
Queen's House, Kingsway, London, W.C.2.
Works: STAFFORD, BRADFORD, RUGBY, PRESTON.

BRANCHES OR ASSOCIATES THROUGHOUT THE WORLD

ARGENTINA, AUSTRALIA, BRAZIL, CANADA, CEYLON, DENMARK, EGYPT, ICELAND, INDIA, JAPAN, NEW ZEALAND, SOUTH AFRICA, MALAYA

In May, 1934, the latest **"SENTINEL" patent steam locomotive** was put through a series of severe tests on a heavily graded metre gauge track in Belgium. **These tests were witnessed** by a number of distinguished British and Continental Engineers and it may be recorded that this new departure in locomotive practice met with unanimous appreciation.

The first result of the success of these trials and the interest they aroused is **an order from the London and North Eastern Railway** for a four-engined locomotive of the new type. This vehicle will be built on two four-wheeled bogies, each of the four axles being driven by a separate two-cylinder double-acting engine geared directly to it and suspended from the bogie frame.

The boiler is of the three drum water-tube "Sentinel-Woolnough" type, and together with the coal bunkers, water tanks, footplate, etc., is mounted on the main frame carried on the two bogies.

The equal distribution of the adhesive weight and the even torque imparted to the axles through the gearing, render coupling rods unnecessary; whilst the completely enclosed motion, thoroughly and scientifically lubricated, ensures long life and low maintenance costs.

An illustrated catalogue containing full particulars will be furnished on application to :—

THE "SENTINEL" WAGGON WORKS LTD.

Railway Department, 20, Iddesleigh House, Caxton Street, London, S.W.1

TYRES AND AXLES

"C.P." and other famous qualities

The requirements of the locomotive and rolling stock engineer are met with satisfaction by the Steel, Peech & Tozer branch of The United Steel Companies Limited. Tyres, axles and crankshafts for locomotives, carriages and wagons of all types are supplied. The special steels we have developed give longest life in all parts of the world, from the frozen plains of Canada to the hottest tropical countries.

Send for a copy of our Booklets, Ref. S.P.T. 118 and 119, giving details of these products. When writing, please give name. Company's name and address, and position in Company.

STEEL, PEECH & TOZER

Branch of
The United Steel Companies Ltd.

THE ICKLES SHEFFIELD

THE UNITED STEEL COMPANIES LTD

SP51

Contractors to the Principal

RAILWAY & ROADWAY COMPANIES

at Home and Abroad

FOR PASSENGER VEHICLES AND GOODS TRANSPORT

Leyland

LEYLAND, LANCS.

There are Leyland Goods Vehicles for gross loads—from 2½ to 12½ tons

The Passenger Range includes four and six-cylinder chassis for Coaches, and single and double-decker Buses

LEYLAND MOTORS LTD. Head Office and Works : LEYLAND, Lancs.

DIRECT BRANCHES IN Auckland, Bombay, Brisbane, Bristol, Calcutta, Capetown, Cardiff, Christchurch, Chorley, Dunedin, Feilding, Glasgow, Hawera, Leeds, Liverpool, London, Manchester, Melbourne, Montreal, Singapore, Sydney, Toronto, Vancouver, Wellington, etc.

SOLID

FORGED AND ROLLED STEEL

WHEELS

TYRES, AXLES & DISC CENTRES

FOR
LOCOMOTIVES
CARRIAGES & WAGONS

TAYLOR BROS
& COMPANY LIMITED

TRAFFORD PARK STEEL WORKS, MANCHESTER.

London Office:
VICKERS HOUSE, BROADWAY,
WESTMINSTER, ——— S.W. 1.

FOR HEAVY DUTY—

TIMKEN

Trade Mark
TIMKEN

Timken bearings on the Burlington Zephyr

The " Burlington Zephyr ", incorporating all the most modern ideas and achieving an extremely high performance, naturally makes use of Timken tapered roller bearings.

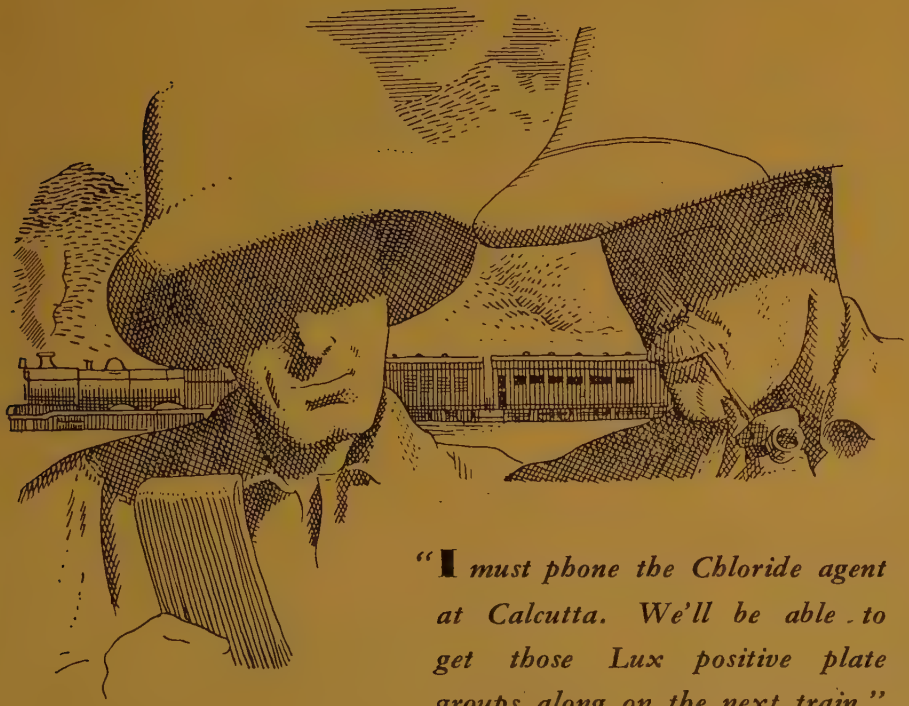
Owing to their heavy load capacity and ability to stand both journal and thrust loads, Timken tapered roller bearings are being extensively used in every field where heavy duties demand the best practice.

BRITISH TIMKEN LTD.
CHESTON ROAD, ASTON, BIRMINGHAM
Telephone : East 1321 (6 lines) Birmingham. - - Telegrams Britimken , Phone, Birmingham.

TAPERED ROLLER BEARINGS

BRITISH MADE

Serving the engineer all over the world . . .



"I must phone the Chloride agent at Calcutta. We'll be able to get those Lux positive plate groups along on the next train."

The Chloride Company, makers of the Lux Train Lighting Battery, offer a service to engineers that is world wide. Lux spares and replacements, not only for the Lux but for all batteries, are always available.

BATTERIES FOR Lux TRAIN LIGHTING

THE CHLORIDE ELECTRICAL STORAGE CO. LTD., EXIDE WORKS, CLIFTON JUNC., NR. MANCHESTER
EXPORT SALES OFFICE: 137, Victoria Street, London, S.W.1.
Branches at Bombay, Calcutta, Capetown, Sydney, Christchurch (N.Z.), Copenhagen, etc. Ch. 297.

THE LARGEST SUBURBAN RAILWAY ELECTRIFICATION IN THE WORLD *has*

METROVICK EQUIPMENTS

968 "Metrovick" MOTOR COACH EQUIPMENTS

886 "Metrovick" TRAILER COACH EQUIPMENTS

The Southern Railway's great suburban electric system continues to expand and with it the use of "Metrovick" Motor and Control equipments.

The new services to Three Bridges and Reigate, forming a portion of the electrification of the main line to Brighton and Worthing, have called for a further 80 Motor Coach and 73 Trailer equipments, bringing the total "Metrovick" equipments in service on this extensive railway electrification up to 968 Motor Coach and 886 Trailer Coach equipments.

METROPOLITAN Vickers

SUBSIDIARY OF ASSOCIATED ELECTRICAL INDUSTRIES LTD.

ELECTRICAL CO., LTD.

TRAFFORD PARK MANCHESTER

A first-class example of Engineering Efficiency

Albion 4/5-ton Lorry fitted with 'Gardner' Oil Engine, one of hundreds supplied to the London, Midland & Scottish Railway.

the ALBION 4/5-tonner

(GROSS LOAD CAPACITY 6-TONS.)

BY APPOINTMENT TO H.M. THE KING OF GREAT BRITAIN

The 4/5-ton Albion carries its load with unfailing reliability under all conditions. It eliminates costly breakdowns and delays. It reduces running and maintenance costs to the minimum. It is, in fact, like all Albions, a completely efficient transport vehicle.

There are Albion Goods Models for gross loads from $2\frac{1}{2}$ to $13\frac{1}{2}$ tons, and Passenger Models from 24 to 60 seats.

Petrol or Oil Engines.

Albion

ALBION MOTORS LTD.
Scotstoun, GLASGOW, W.4.
London: - - Bank Buildings, 20 Kingsway, W.C.2.
Also at Manchester, Liverpool, Leeds, Sheffield, Nottingham, Birmingham, Bristol, Edinburgh and Belfast.

railcars contribute to the solution of local traffic problems

THE A.E.C. express Railcars operated by the G.W.R. are powered by two 130 h.p. A.E.C.-RICARDO Oil Engines which, with other mechanical units, are placed beneath the floor in easily accessible positions. These cars are of the luxury type and include a modern buffet compartment and a dining car with detachable tables provided between all seats. As with the original A.E.C.-built G.W.R. Railcar, the express units are streamlined, following the latest aerodynamic practice. Full details will gladly be sent on request.

The Associated Equipment Co. Ltd. Southall, Middlx.

BUILDERS OF LONDON'S BUSES

'DULUX' COACH FINISHES

TRADE MARK

for use in all climates

Buses for the NIZAM STATE RAILWAY, INDIA
BUILT BY—PARK ROYAL COACHWORKS, LTD

'DULUX' Coach Finishes have proved their value, not only in the British Isles but in all parts of the world. We have always claimed that they are 50-100% more durable than the old-type oil materials but under the most rigorous possible conditions they have been found to have 300% to 400% longer life.

'DULUX' Coach Finishes are easy to apply by brush or by spray and have already been adopted as standard by many operating companies. 'Dulux' combines first-class appearance, does not crack and is very hard to chip.

When repainting is necessary, one colour coat of 'Dulux' will give a refinish job with all the normal 'Dulux' durability as compared with a coat of oil varnish.

We shall be pleased to supply full particulars of our recommended finishing process and colour cards.

NOBEL CHEMICAL FINISHES LIMITED
SLOUGH *(Associated with Imperial Chemical Industries Limited)* BUCKS

D.I. 201

Soc. An. LA BRUGEOISE et NICAISE & DELCUVE

Works at SAINT-MICHEL
near BRUGES and at
LA LOUVIERE (Belgium)

Diesel Maybach 410 - HP
twin railcar for the Belgian Railways

ROLLING STOCK
and FIXED EQUIPMENT
for Railways and Tramways

RAIL MOTOR CARS

ALL-METAL CARRIAGES — SLEEPING CARS — RESTAURANT CARS
SELF-DISCHARGING HIGH-CAPACITY WAGONS — TANK WAGONS — TENDERS

Bridges — Frames — Tanks — Gasometers

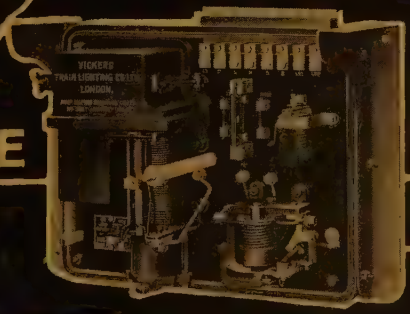
SIEMENS MARTIN STEEL WORKS

WHEEL SETS — TYRES — AXLES — STEEL CASTINGS — SPRINGS

VICKERS "V.I."

SINGLE BATTERY SYSTEM for ELECTRIC LIGHTING OF TRAINS.

THE DOES THE WORK

AND THE  CONTROLS THE LIGHT

CALL AND SEE IT IN OPERATION IN OUR SHOWROOM

VICKERS TRAIN LIGHTING Co LTD

(Proprietors: VICKERS LIMITED)

VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

Telegrams: VICTRALITE, SOWEST, LONDON. Cablegrams: VICTRALITE LONDON Telephone: VICTORIA 6900.

Knorr's Cross-Compound Air Compressors

Air brakes need reliable air supply. The cross-compound air compressor with steering mechanism type Nielebock (patented) has proved its value many thousand times.

The advantages are: troublefree working — smooth and noiseless running — high performance with little steam consumption and high volumetric efficiency — compact design and small weight.

The air compressor delivers 106 cu. ft. per minute of air sucked-in against pressures up to 147 lbs. per sq. inch. Economically lubricated by a pump working in accordance with the number of piston strokes. Easily interchangeable and automatically adjustable metal stuffing boxes for piston rods in steam- and air portion. Handy located and massless air valves.

A governor cuts out the compressor as soon as working pressure is reached in main reservoir, and cuts in on the slightest drop in reservoir pressure.

KNORR-BREMSE
A-G BERLIN O 112

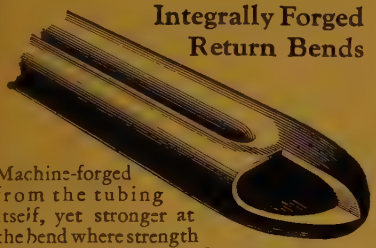
Alphabetical Index of Advertisers

Firms:		Specialities:
Albion Motor Car Co.	XVI	Commercial and public service motor vehicles.
Anglo-Franco-Belge, S. A.	—	Locomotives and Railway rolling stock.
Anti-Attrition Metal Co. (The)	XXVII	Bronzes and white bronzes for railway purposes.
Armstrong Oiler Co., Ltd. (The)	XXV	Lubricators.
Associated Equipment Co., Ltd. (The)	XVII	Passenger and commercial motor vehicles.
Ateliers de Constructions Electriques de Charleroi	XXIX	Electric train lighting. Electric signalling.
Ateliers Métallurgiques	—	Locomotives, Railway and Tramway rolling stock.
Auxiliaire des Chemins de fer et de l'Industrie	—	Preheaters, Purifiers, De-areators.
Bayliss, Jones & Bayliss, Ltd.	—	Railway fastenings, rail screws, etc.
Beardmore & Co., Ltd. (Wm.)	—	Diesel motor coaches, etc.
Bonnel (1924), Ltd. (W. A.)	—	Cemented waterproof. Sleepers, crossings, etc.
British Timken, Ltd.	XIII	Axle boxes for rolling stock.
Broughton Copper Co., Ltd. (The)	XXVII	Copper tubes, copper rods, copper plates.
Brugeoise et Nicaise & Delcuve (La)	XIX	Railway rolling stock and fixed equipment.
Chloride Electrical Storage Co., Ltd. (The)	XIV	Train lighting batteries.
Churchill Machine Tool Co., Ltd. (The).	XXXI	Precision grinding machines.
Cockerill & Co. (John)	—	Iron and steel in all forms.
Coltness Iron Co., Ltd.	XXIX	Locomotive Steel Castings.
Davies & Metcalfe, Ltd.	—	Injectors, ejectors, etc.
Demag A. G.	—	Special Cranes and Lifting Appliances.
Docker Brothers	XXVI	Varnishes, Japans, Fine colours, etc.
Dunlop Rubber Co., Ltd.	—	Rubber springs, Buffers, Hosepipes.
English Electric Company, Ltd. (The)	VIII	Railway electrification.
Firth (Thos) & Brown (John), Ltd.	VII	Hollow forgings. Tyres, axles, etc.
Frichs A/S.	—	Diesel-electric locomotives.
Gresham & Craven, Ltd.	—	Ejectors, injectors, lubricators, etc.
Guest, Keen & Nettlefolds, Ltd.	XXX	Screws.
Haine-St-Pierre (Forges, Usines et Fonderies de)	—	Railway rolling stock.
Hasler, S. A.	—	Speed Indicators.
Herbert, Ltd. (Alfred)	—	Makers of machine tools.
Hoffmann Mfg. Co., Ltd. (The)	XXVIII	Bearings.
Imperial Chemical Industries, Ltd.	XVIII	« Dulux » coach finishes.
Karrier Motors, Ltd.	—	Road motor vehicles.
Kearns & Co., Ltd. (H. W.)	—	Borers.
Knorr-Bremse, A. G.	XXI	Air brakes, feedwater heaters, etc.
Laminated Wood Products, Ltd.	—	« SARO » Plywood.
Leyland Motors, Ltd.	XI	Passenger and goods motor vehicles.
Lightalloys, Ltd.	—	Aluminium alloys in all forms.
Metropolitan Cammel Carriage Wagon & Finance Co., Ltd.	—	Rolling stock of all kinds.
Metropolitan Vickers Electrical Co., Ltd.	XV	Railway-Electrification.
Pritchett & Gold and E. P. S., Ltd.	XXXI	Accumulators for train lighting.
Rexine, Ltd.	XXVIII	Leathercloths.
Roberts, Ltd. (J. W.)	XXX	Asbestos products in all forms.
« Sentinel » Waggon Works, Ltd. (The).	IX	Locomotives. Rail cars, etc.
Spencer (J.) & Sons, Ltd.	—	Railway springs, axle forgings, etc.

Firms:		Specialities:
Spencer-Moulton & Co., Ltd. (George) .	XXXII	India rubber springs of all kinds.
Still & Sons, Ltd. (W. M.)	—	Kitchen and service equipment.
J. Stone & Co., Ltd.	—	Railway specialities of all kinds.
Superheater Company (The), London . .	—	Superheaters for locomotives and multiple valve regulator headers.
Superheater Company (The), New York.	XXIV	Steam superheaters for locomotives, marine, etc.
Taylor Bros & Co., Ltd.	XII	Wheels and axles.
United Steel Companies, Ltd. (The) . .	X	Steel sleepers, steel for all purposes.
Usines Emile Henricot (S. A.)	—	Steel and iron founders.
Vacuum Brake Co., Ltd.	XXVI	Air brakes.
Vacuum Oil Company, Ltd.	VI	Lubricants for locomotives.
Vereinigte Eisenbahn-Signalwerke . . .	IV	Railway signalling.
Vereinigte Westdeutsche Waggonfabriken	—	Rolling stock.
Vickers Train Lighting Co., Ltd. . . .	XX	Train lighting dynamos and equipment.
Vi-Spring Products, Ltd.	—	Seat springs.
Wakefield & Co,, Ltd.	V	Mechanical lubricators: oils for all purposes.
Westinghouse Brake & Saxby Signal Co., Ltd. (The)	I, II, III	Railway signalling. Brakes. Heating systems.
Wild & Co. (A. G.)	—	Railway supplies, steam heating, etc.
Willford and Company, Ltd.	XXV	Railway springs and for all their purposes.

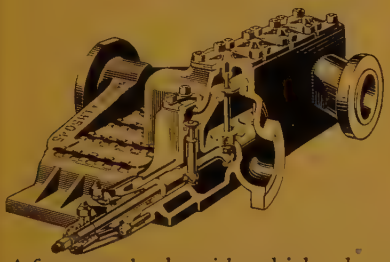
Serving
the SUPERHEATING REQUIREMENTS *of the* WORLD'S RAILWAYS

Integrally Forged Return Bends



Machine-forged from the tubing itself, yet stronger at the bend where strength is most needed. Provides constant area through the bend, with smooth internal and external surfaces—avoiding restriction of steam through units or accumulation of soot, ashes or cinders.

Multiple-valve Throttle-headers



A finger-type header with multiple-valve throttle or regulator contained in the casting. Without changing smokebox arrangement this throttle-header offers distinct advantages: Steam is controlled between the superheater and cylinders; superheated steam is always available for auxiliaries; use of a series of small valves opening and closing consecutively gives better and quicker control of locomotive movements.

Through a coordinated service with associated organizations in Great Britain, France, Germany, the United States, Canada, and Australia, the railways of the world are served with locomotive superheating equipment, that conforms to a general standard of practice, yet is adapted to the particular requirements of each individual country.

A distinguishing characteristic of the locomotive superheaters manufactured by these associated companies is the exclusive use of return bends, integrally forged with the tubing to form the loops of the superheater elements or units. These bends are machine-forged without utilizing either additional material or a flux. Railroads the world over have standardized on locomotive superheaters with these integrally-forged return bends. They have been applied to more than 100,000 locomotives.

These associated companies, as a result of constant development and research, and interchange of combined experience in modern railroading, offer improved superheating equipment to meet the changing conditions of locomotive operation. An outstanding recent development, now being adopted rapidly for every class of locomotive service, is the multiple-valve throttle-header.

THE SUPERHEATER COMPANY

60 East 42nd Street, New York, N. Y., U. S. A.

ASSOCIATED COMPANIES:

The Superheater Company, Limited
Dominion Square Bldg., Montreal, CANADA

The Superheater Company Limited
Bush House, Aldwych, London, W.C.2, ENGLAND

Compagnie des Surchauffeurs
Rue la Boëtie 3, Paris, FRANCE

Schmidt'sche Heissdampf-Gesellschaft, m. b. H.,
Rolandstrasse 2, Cassel-Wilhelmshöhe, GERMANY

The Superheater Company (Australia) Limited
Manchester Unity Building, 185 Elizabeth Street, Sydney, N. S. W.

Agencies Throughout the World

A-914

Telegraphic Address : OILER, YORK Code used : ABC 5th Edition Telephone : 2946

THE ARMSTRONG OILER Co, Ltd. YORK

Patentees and manufacturers of **The « ARMSTRONG » Oiler**

For lubricating
All Types of Railway
and Tramway Journals

Efficient and Perfect
in Every Detail

WATER PROOF
OIL PROOF
DUST PROOF
FOOL PROOF

« ARMSTRONG OILER » fitted with Oil Seal for tip Wagon Axle Boxes

SAMPLE SETS FOR TRIAL SUPPLIED FREE OF CHARGE

SPRINGS

WILLFORD & COMPANY LIMITED.

ESTABLISHED 1890

LONDON OFFICE
34, Victoria Street,
Westminster, S.W.1.

PARK HOUSE WORKS, SHEFFIELD.

Telephone: 21114 SHEFFIELD.
Telegrams: "AUDAX, 'PHONE, SHEFFIELD."
Code: BENTLEYS

ALSO AT
BURNBANK WORKS,
DENNISTOUN, GLASGOW.

CONTRACTORS TO THE LEADING BRITISH, INDIAN, SOUTH AMERICAN AND COLONIAL RAILWAYS.
MODERN PLANT. SERVICES OF FIRST CLASS DESIGNING STAFF AVAILABLE.

D O C K E R S'

PAINTS & VARNISHES

FOR ROLLING STOCK

ALSO

SYNTHOLUX the New air-drying Synthetic Paint of extraordinary character and durability. Suitable for brush or spray application.

THERMOLUX low temperature Stoving Enamel is the latest industrial finish. It is applied by spray and the finish is very hard, lustrous and has great durability.

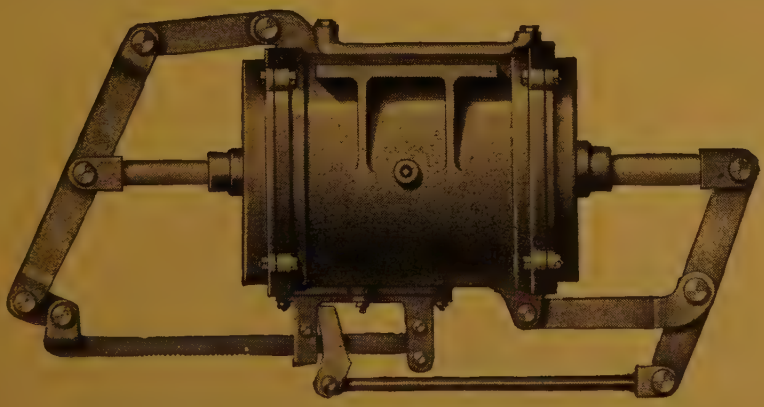
INDUROLEUM the modern floor covering for coaches and buildings; fireproof and hygienic.

OUR UNRIVALLED EXPERIENCE IS FREELY AT YOUR DISPOSAL.

DOCKER BROTHERS

HEAD OFFICE & WORKS. ROTTON PARK STREET, **BIRMINGHAM 16.**
Telephone : EDGBASTON 3001. Telegrams " JAPAN, BIRMINGHAM "
LONDON DEPOT : 4-6, MOOR LANE, LONDON. E. C. 2
Telephone : METROPOLITAN 2775. Telegrams " MATURED BARB, LONDON "

MULTIPLE POWER VACUUM BRAKE CYLINDER.



Gives multiplied brake power without increasing size, weight, or air consumption. Specially suitable for heavy Electric and Diesel-Electric Locomotives where available space is restricted.

THE VACUUM BRAKE COMPANY, LTD.
3-7, Old Queen Street, Westminster, S.W.1.
Telephone: WHITEHALL 4069. Telegrams: SOLUTION, PARL, LONDON.

GRESHAM & CRAVEN, LTD., Manchester.

ANTI-ATTRITION

BRONZES AND WHITE BRONZES

ANTI-ATTRITION BRONZES ARE THE MOST EFFICIENT FOR LOCOMOTIVE AXLE BOXES, BEARINGS, BUSHES, SLIDE VALVES, AND ALL NON-FERROUS WEARING PARTS.

ANTI-ATTRITION WHITE BRONZES FOR LINING UP LOCOMOTIVE BEARINGS, CONNECTING ROD AND COUPLING ROD BUSHES, ECCENTRIC STRAP LINERS,

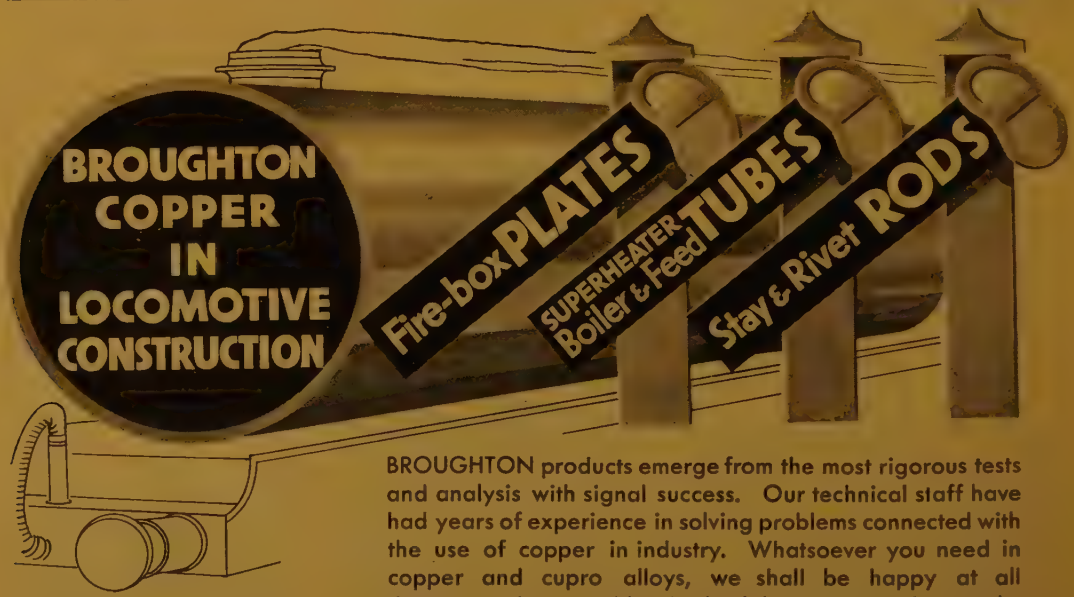
CARRIAGE AND WAGON BEARINGS, ETC.
SUPPLIED IN INGOTS, CASTINGS, OR ACCURATELY FINISHED TO SAMPLES OR DRAWINGS.

CONTRACTORS TO THE ADMIRALTY, WAR OFFICE, DOMINION GOVERNMENTS BRITISH AND FOREIGN RAILWAYS, LONDON COUNTY COUNCIL AND OTHER CORPORATION TRAMWAYS, STEAMSHIP COMPANIES, MOTOR TRANSPORT COMPANIES AND ENGINEERS.
SOLE MANUFACTURERS

LONDON OFFICE
1, VICTORIA ST., S. W. 1.

THE ANTI-ATTRITION METAL COMPANY, LTD.

Glengall Works, Glengall Rd.
London, S. E., 15



BROUGHTON products emerge from the most rigorous tests and analysis with signal success. Our technical staff have had years of experience in solving problems connected with the use of copper in industry. Whatsoever you need in copper and cupro alloys, we shall be happy at all times to assist you, either in the laboratory, or in supply.

" STAY-TITE " Copper
(SILVER - ARSENICAL)
for Stay-rods, Plates and Rivets. Does not permanently deform under compressive stress, and so avoids leakage and prevents wastage at Stay-heads.

BROUGHTON COPPER COMPANY LTD.
MANCHESTER, ENGLAND

SIMPLICITY coupled with EFFICIENCY

powerfully suggests the

HOFFMANN

ROLLER BEARING AXLE BOX

THE HOFFMANN MANUFACTURING Co. LTD. CHELMSFORD, ESSEX

"Rexine" BRAND

LEATHERCLOTH

FOR PANELLING ON THE ROYAL SCOT

'Rexine" is used for panelling below the luggage racks in the 3rd class carriages and cream roof lining on the Royal Scot and also for wall panelling in the sleeping berths and corridors on the night trains. "Rexine" is by far the most hard wearing material for panelling and is obtainable in a very wide range of attractive finishes. Full particulars and patterns on application.

I.C.I. (REXINE) LTD. HYDE, CHESHIRE.
I.C.I. (Rexine) Ltd. is a subsidiary company of Imperial Chemical Industries Limited.
London Office: 60 Wilson St., Finsbury, E.C.2

R.A.397

A.C.E.C.

Ateliers de Constructions
Electriques de Charleroi

Electric traction plant
Motors and equipment
Electric lighting plant
for trains

Electric signalling
Wires and Cables

7011 3

Coltness Iron Company Limited

NEWMAINS, LANARKSHIRE, SCOTLAND

We specialize in
Locomotive Steel Castings

Wheel Centres, Domes, Piston Heads, Horn Blocks, Axleboxes, etc.
of which we are the largest makers in Great Britain
Steel castings up to 15 tons - Iron Castings up to 50 tons

London Office : 10 Iddesleigh House, Caxton Street, London S. W. 1.
Indian Office : Turner Hoare & Co., Gateway Bldg. Appollo Bunder, Bombay
South African Office : D. Drury & Co. Ltd., P. O. Box 3929, Johannesburg

NETTLEFOLDS SCREWS

Standard quality all over the world

TRADE MARK

GUEST, KEEN & NETTLEFOLDS, LIMITED,
BIRMINGHAM – ENGLAND

J. W. ROBERTS LTD

SPECIALISTS IN THE MANUFACTURE & APPLICATION OF

HEAT INSULATION
for LOCOMOTIVES, CARRIAGES
TANK WAGONS, REFRIGERATOR VANS
RAIL CARS AND ROAD VEHICLES, ETC.

FIREPROOF PANELLING
FLOORING, PARTITIONS,
DECORATIVE PANELLING

ETC.

NOISE REDUCTION

MIDLAND WORKS
ARMLEY, LEEDS 12

LONDON, 1 BROAD
STREET PLACE, E.C.1

You can produce a job with better lasting qualities, and save time and money by grinding:—

Journals, crankpins, horn cheeks, motion parts, slide bars, piston rods, superheater headers, regulator valves.

We can supply thoroughly proved Precision Grinding Machines that have been designed in co-operation with Railway Engineers for these and other classes of work in the Railway Shop.

You should have details of these machines.

Ask for a copy of "Precision Grinding in the Railway Shop".

THE CHURCHILL

Machine Tool Co. Ltd.

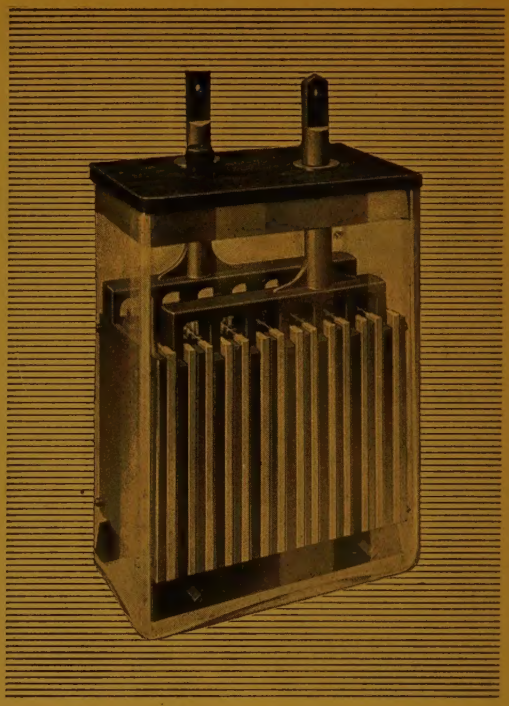
Broadheath, Manchester, England.

Home Selling Agents:

MESSRS. CHAS. CHURCHILL & CO., LTD., London and Branches

Export Sales Organisation:

ASSOC. BRITISH MACHINE TOOL MAKERS LTD., London and Branches



Always Reliable under any conditions

P.&G. AND E.P.S. CELLS

FOR TRAIN LIGHTING

PRITCHETT & GOLD AND E.P.S. CO., LTD.

50, GROSVENOR GARDENS, LONDON, S.W.1

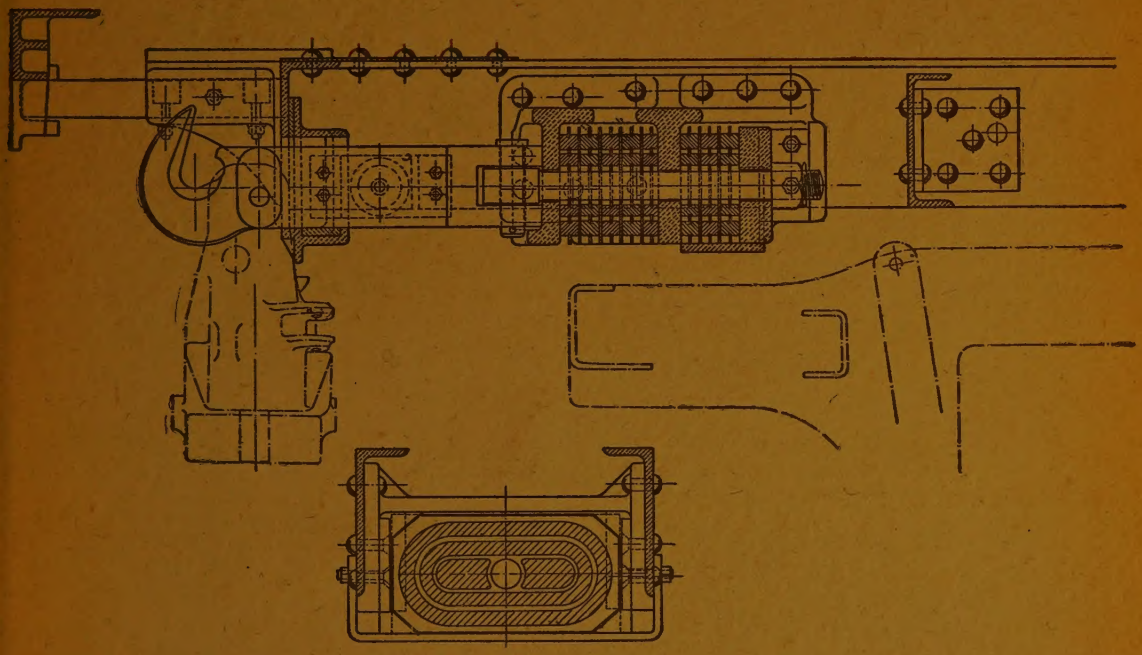
'Phone: Sloane 7164. 'Grams: Storage, Sowest, London

Works: Dagenham Dock, Essex

P.R.10.

L.N.E.R. TOURIST TRAINS

TANDARD ARRANGEMENT OF BUCKEYE BUFFER & DRAWGEAR FOR STEEL
NDERFRAMES FITTED WITH SPENCER MOULTON SPRINGS



CROSS SECTION

Fitted with

SPENCER MOULTON RUBBER SPRINGS

GEO. SPENCER MOULTON & CO. LTD., 2, CENTRAL BUILDINGS, LONDON, S.W.1

M. WEISSENBRUCH
BRUXELLES